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A Second Look
MACINTOSH
The Machine and Its Software

FAMILY COMPUTING

2ND
ANNIVERSARY
ISSUE

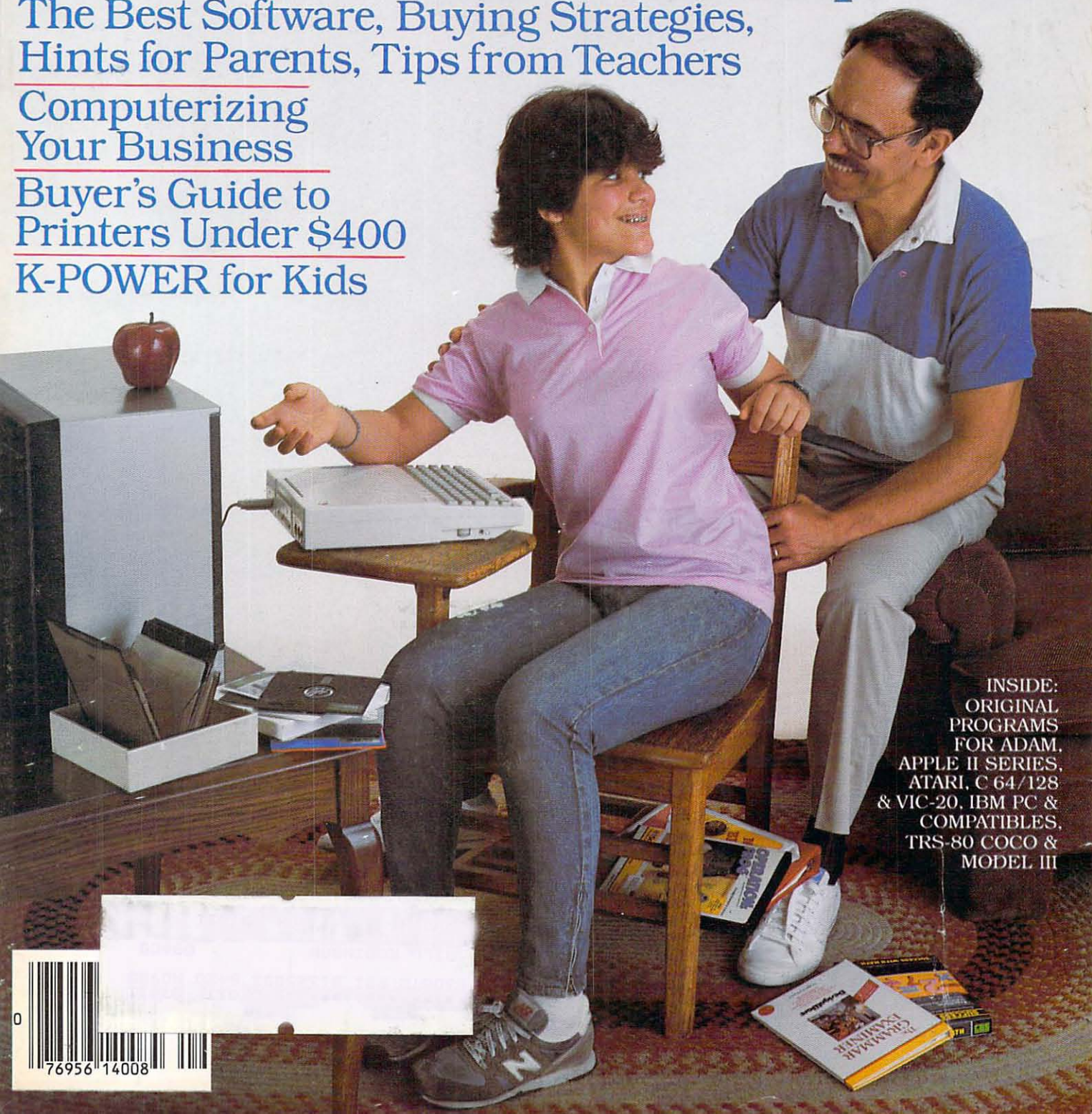
Learning at Home with Computers

The Best Software, Buying Strategies,
Hints for Parents, Tips from Teachers

Computerizing
Your Business

Buyer's Guide to
Printers Under \$400

K-POWER for Kids



INSIDE:
ORIGINAL
PROGRAMS
FOR ADAM,
APPLE II SERIES,
ATARI, C 64/128
& VIC-20, IBM PC &
COMPATIBLES,
TRS-80 COCO &
MODEL III





Why every kid should ha

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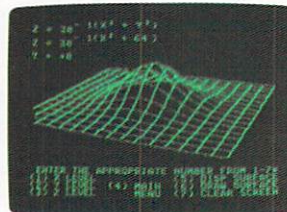
The IIc is just like the leading computer in education, the Apple IIe. Only smaller. About the size of a three-ring notebook, to be exact.

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which you might be interested in yourself.

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preparation programs for college hopefuls.

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Not to mention fun programs for the whole family. Like "Genetic Mapping" and "Enzyme Kinetics."



ve an Apple after school.

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The Wizard will use his magic powers to replenish the energy in your flashlight if you spell the

word correctly, but each time you are wrong he will draw energy from your light. When your flashlight runs out of energy you will be doomed to roam through the cave in darkness forever.

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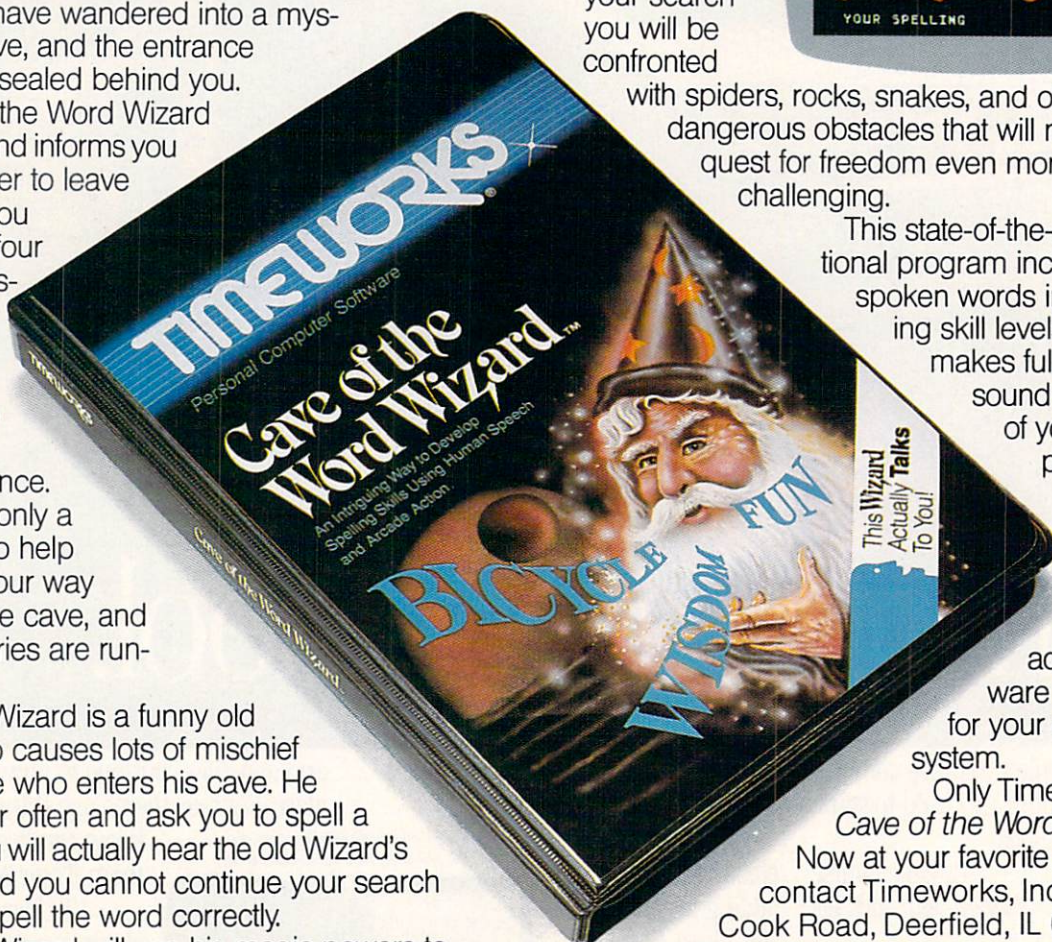
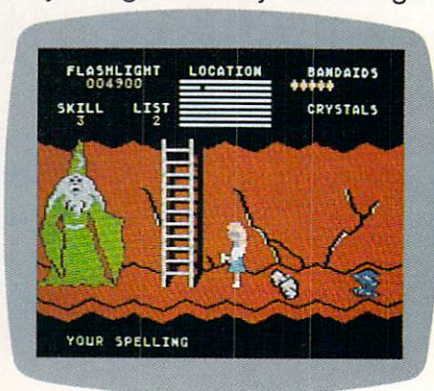
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FAMILY COMPUTING

FEATURES

29 A PARENT'S GUIDE TO LEARNING AT HOME WITH COMPUTERS

Inside this issue you'll find out how to use the computer to enhance learning. We've provided a Buyer's Primer, Bulletin Board (for information services), Talk to Teachers (answering your most frequently asked questions), and Critics' Choices (the best of the best educational software according to our family reviewers).

39 COMPUTERIZING YOUR SMALL BUSINESS

by Barbara E. and John F. McMullen

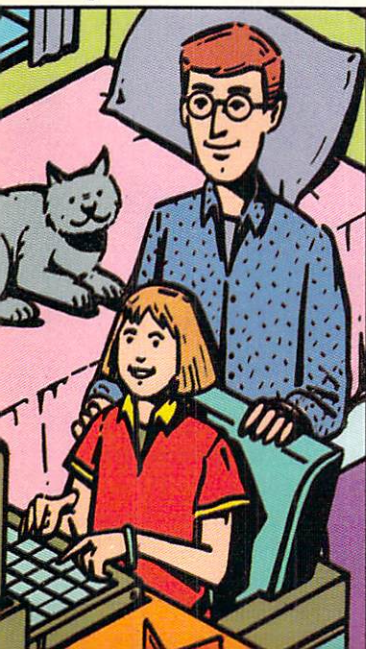
How to get started: pitfalls to avoid, common misconceptions, and sources of information.

42 1985 COMPUTING FAMILY OF THE YEAR

by Linda Williams

Meet the Mancinis of Long Island and find out why they were chosen as the best example of the modern computing family.

Page 29



44 BUYER'S GUIDE TO PRINTERS

by Joe Gelman

You can find letter-quality, high-speed dot-matrix, and color printers for less than \$400.

47 A SECOND LOOK AT THE MACINTOSH

by Charles H. Gajeway

Is it a business machine, a home machine, or both? You decide when you take another look.

PLUS: MAC SOFTWARE SAMPLER

K-POWER

81 Programming Tips from a Pro

Advice from Gabrielle Savage of Tom Snyder Productions.

83 Dr. Cursor's Klinik

Generating foreign characters and data statements.

84 Game Strategy

Tips, tricks, and hints.

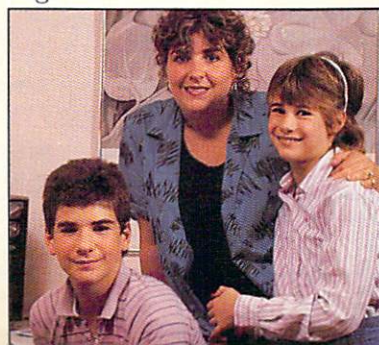
86 Microtones

Arcade Alley: song and arcade sounds in one program.

88 Compucopia

This machine-code routine will clear part or all of your computer screen.

Page 42



PROGRAMMING

54 TIPS TO THE TYPIST

56 BEGINNER PROGRAM

Terminal Tale can tell a million stories. For ADAM, Apple, Atari, C 64/128 & VIC-20, IBM PC & compatibles, TI-99/4A, and TRS-80 CoCo & Models III & 4.

64 CREATIVITY PROGRAM

Harness your printer to your imagination with *Draw & Print*, for Apple, Atari, C 64/128 & VIC-20, IBM PC & compatibles, and TRS-80 CoCo & Models III & 4.

72 PUZZLE

Help crack little Ehrich's caper, using your ADAM, Apple, Atari, C 64/128 or VIC-20, IBM PC or compatibles, or TRS-80 CoCo or Models III or 4.

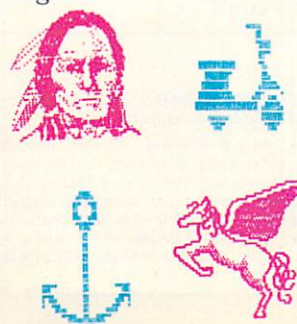
NEW PRODUCTS

90 NEW HARDWARE/ MARKET UPDATE

The latest products on the market, including an IBM-compatible computer from Leading Edge, AT&T Model 4000 modem, and upgrades for the Tandy 1000.

92 SOFTWARE GUIDE AND REVIEWS

Page 44



DEPARTMENTS

4 EDITOR'S NOTE

9 LETTERS

10 WORKING AT HOME

by Roxane Farmanfarmaian

Add color and design to your business with graphics software. PLUS: FOUR STEPS TO CHOOSING THE RIGHT SOFTWARE

13 COMPUTING CLINIC

14 TELECOMPUTING

by Anne Krueger

Explore online data bases, and you'll find a mountain of education information.

18 GAMES

by James Delson

A sample of some of the best games around.

102 CLASSIFIED

104 ADVERTISERS' INDEX

COVER PHOTOGRAPH BY JOEL WHITE

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EDITOR'S NOTE

WE'VE COME A LONG WAY

Two years, or 24 issues, ago FAMILY COMPUTING made its debut. While magazines devoted to specific aspects of computer use were sprouting everywhere, we were hailed as different.

Various observers noted that our articles could be easily understood; others commented on the objectivity of our reviews; some paid special attention to our original programs for a wide variety of popular computers; and still others concentrated on our emphasis on applications and users rather than on machines. Among the major distinctions was recognition that we were a mass market magazine for the consumer interested in computing, not "just another computer magazine," aimed at the hobbyist.

During the ensuing two years we have remained steadily on course, providing service to readers seeking the greatest possible benefits from their computers. We have, in effect, sought to be as close to personal advisers for our readers as is possible. The growth of our circulation, to more than 400,000, indicates that we have been at least somewhat successful in reaching our goals.

Not everything has remained constant the past couple years. We all know that the gargantuan growth initially projected for the computer marketplace didn't materialize.

But growth there has been! In 1983, when we began, there were 6 million computers being used in homes. Today there are more than 18 million, and 4.2 million more are expected to be added in the year to come.

In 1983, when we began, manufacturers doubted that the consumer would spend much money on com-



puting. People were buying mostly low-cost, less powerful computers for use in the home. Today, the average price for a computer without printer is about \$500. That means that just our 400,000 readers have spent a minimum of \$200 million on their basic computing units. That doesn't even take into account the hundreds of millions more for printers, monitors, modems, disk drives, software, disks, and other computer equipment and supplies.

Today, in 1985, Apple, Atari, Commodore, and Tandy are each selling at least two computer models, plus peripherals and software, for family use.

Today, in 1985, we know there is a market for computing in the home!

CLAUDIA COHL
EDITOR-IN-CHIEF

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LETTERS

NO COMPLAINT

I rarely write letters to magazines except to complain about problems. I guess I seem to feel that no complaint is viewed by the magazine as positive reinforcement. Up until October, I was a dedicated CoCo owner/fan and saw no reason to buy any other computer magazine besides those designed specifically for the CoCo.

In October, I purchased an IBM PCjr because of the need/desire to utilize a specific home-finance program that you reviewed in your magazine (*Managing Your Money*, by Andrew Tobias from MECA). I wanted the program so much I purchased another computer.

I was very impressed with your magazine (November 1984 was the first issue I purchased). It relates home computers to practical home applications. It is not game-oriented. It has sensible and honest reviews of both hardware and software. I especially like the articles describing a specific family situation. Your magazine does not discriminate against any particular brand of computer (I discovered many magazines did not even address the CoCo, since they considered it a game machine only). Your magazine is for the novice as well as the experienced user.

In short, I would like to praise your magazine's efforts at really addressing the family applications of the personal computer.

MICHAEL L. TUCKER
Spanaway, Washington

A PROFESSIONAL INTEREST

I enjoy your magazine each month very much, and I am glad I subscribed. Your articles and programs are extremely interesting and useful.

I am studying in college to obtain my business and accounting degree, and I have really enjoyed your programs in the Home/Money Management section. I was, however, disappointed to discover that there were no program modifications for the Atari computer. I was interested in your *Financial Goal Planning* and *Cost Analyzer* programs because they directly relate to my field of study.

Would it be possible to print the modifications for these two programs in an upcoming issue? Would it be possible to make Atari modifications a permanent feature of

Home/Money Management?

Also, I was curious to find out how I might get hold of a copy of two programs that I missed in some back issues of the magazine. I am interested in the programs entitled *Mailing List* (November 1984) and *Disk Label Maker* (June 1984) for the Atari 800XL computer. Any help you could give me in obtaining these programs would be greatly appreciated.

TONYA COSGROVE
Tampa, Florida

EDITOR'S NOTE: We're glad you're enjoying our Home/Money Management department. Unfortunately, because of space limitations, we must limit the number of modifications we run. A large amount of interest from Atari owners could result in Atari modifications in future issues.

As for your other requests, unfortunately, the Mailing List program was published for only the Apple computer. You can get a copy of Disk Label Maker for Atari, however, by ordering a back issue of the magazine. Just fill out the order form on page 75 of this issue.

GOOD COMMUNICATION

I thought your article "The Great Computer Phone Link" (March issue) was well-written and informative.

However, the chart on page 29 referred to Hayes as Hayes Products, a well-known joystick manufacturer. Many people confuse the two companies because of the similarity in names. Hayes Products just recently changed its name, so hopefully the confusion will end.

I realize that Hayes Microcomputer Products, Inc. is too long for many comparative charts, so please use Hayes or Hayes Inc. in any future issues. Again, great article.

NICK WREDEN
Hayes Microcomputer Products, Inc.
Norcross, Georgia

EDITOR'S NOTE: Thanks for the clarification.

FAMILY COMPUTING looks forward to letters from all our readers. Please direct your correspondence to: Letters to the Editor, FAMILY COMPUTING, 730 Broadway, New York, NY 10003. Include your name, address, and phone number. We reserve the right to edit your letters for length and clarity.

SEE PAGES 6 and 7

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WORKING AT HOME

COMPUTER GRAPHICS

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BY ROXANE FARMANFARMAIAN

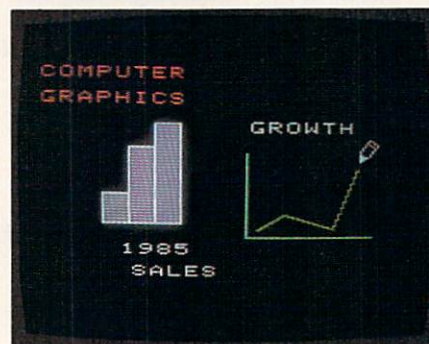
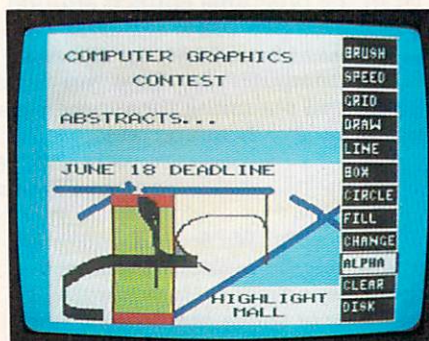
Last summer, when Norman Richards presented his monthly report to the general manager of Bethlehem Mines Corp. in Tamaqua, Pennsylvania, it was a report with a difference. Working at home with his silent partners, an Apple IIe and *pfs: Graph*, Richards had designed business-quality bar graphs to illustrate the report's budgetary analyses and forecasts. They cost him next-to-nothing to produce, and by updating data saved the month before, he can turn them out in as little as half an hour at home in the evening.

His boss' surprise and pleasure at the visually enhanced report were probably no greater than Richards' own. "I haven't done any graph work since college math," he admitted. "I got the computer mainly for the kids—but then I bought *pfs: Graph*, found that it was very easy to use, and started incorporating graphs into the reports. I'm the only one in the company, I think, who does that," he continued. "If it wasn't for the computer, I wouldn't be able to do it either."

Generating charts is only one of many ways the personal computer's graphics capabilities can be put to work on the business front—at home. Pictures (preset on disk or ones you draw) and lettering (available in a range of fonts) can be utilized in promotional materials. Colorful diagrams and image sequences can be used to explain difficult concepts for business presentations or for educational purposes. Architects, interior designers, and others can use the computer as a design tool to develop spatial ideas on-screen.

Computer owners employed (or self-employed) in many professions are relying on computer graphics to supplement or enhance their businesses for a variety of reasons. For some, generating graphics at home on the computer is an all out money saver—eliminating the cost of a designer, typesetter, or printer. For

ROXANE FARMANFARMAIAN, is copy and research chief for FAMILY COMPUTING.



Delta Drawing (top) and Beagle Graphics (bottom) make business graphics easy to create at home.

others, creating graphics on the computer means having visuals when otherwise there would be none (perhaps because of budgetary constraints). Still in other cases, the computer provides alternative graphics that supplement more traditional tools and pictures. Best of all, the computer can be used any time—in the evening, on weekends, or between commitments during the day.

As Richards pointed out, you don't need a master's in contemporary art to make use of the computer's graphic potential. There is good software on the market (see box) that allows you either to merge ready-made charts, typefaces, and/or pictures into your materials, or to change existing designs or create your own from scratch. While some programs offer only professional applications, many others serve double duty, providing entertainment for the whole family. In fact, many of the people who apply computer graphics to business bought their first graphics program for family use. As they discovered the quality of the images, however, and experimented with the

flexibility in rendering those images, they began to see the advantages graphics could bring to various aspects of their work.

MULTIPURPOSE ART MACHINE

When the board members of the Eureka Mall Association received their first memo on letterhead stationery from Cathy Ray-Tubbs, their new promotion director, they were impressed by how slick it looked, but, no doubt, concerned at the cost. "No extra cost," explained Tubbs. She'd generated the letterhead using *The Print Shop*, from Broderbund, at home on her Apple IIe and Image-Writer printer.

The letterhead memo was only the tip of the iceberg. Soon, six sandwich boards, which had been gathering dust in a closet, were back in circulation on the mall floor, sporting large posters that Tubbs produced almost entirely on her computer. With the DOS 3.3 version of *Fontrix*, by Data Transforms, Tubbs (who has a bachelor's degree in English and art) uses a mouse (a handheld cursor-control device) to choose lettering in various fonts. She then enlarges the posters on a photocopier and, depending on the design, outlines the letters in ink and adds color by hand. Total time required to turn out 12 posters for the mall each week? One hour.

"It would be impossible to get my job done without the computer," Tubbs says. "I even bring my [new] IIc into work with me sometimes. I use it to create banners for the mall's showcase, and ads for the newspaper to announce upcoming promotions. I also make coupons with it for special giveaways."

Tubbs' artistic efforts have earned her accolades from both her boss and the board. The graphics have also been responsible in part for an increase of traffic into the mall. If it weren't for the computer, however, there would be few, if any, graphics in evidence. The promotional budget

Net WorthTM scores "a bull's-eye" with critics and you!

"Until Your Personal Net Worth came into our lives, our budget was non-existent, and our financial planning was reminiscent of the Stone Age."

Betsy Byrne
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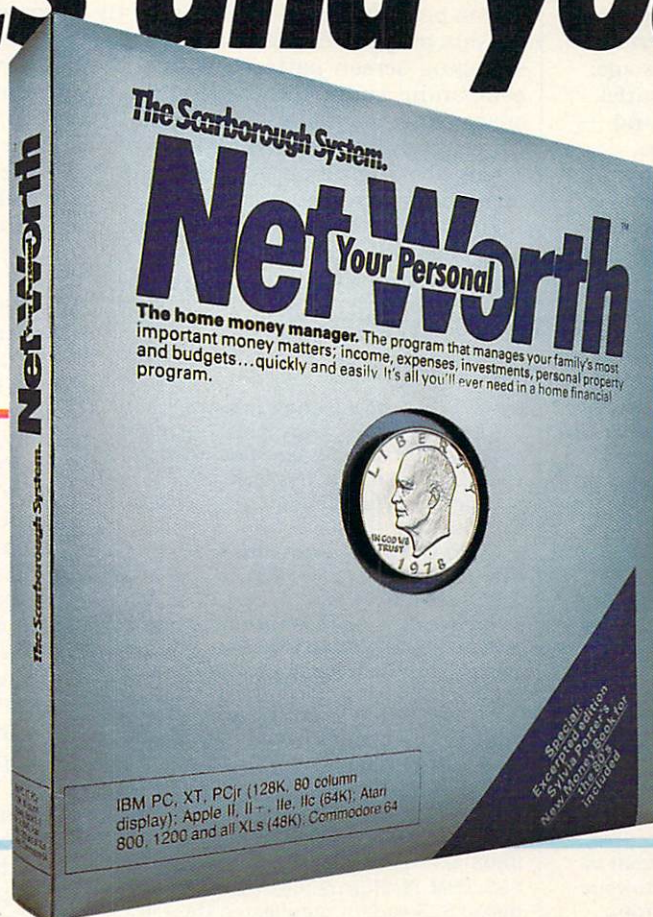
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WORKING AT HOME

allows for the purchase of printer ribbon and paper, but not typesetting, and Tubbs' schedule is too tight to allow her to create the materials by hand. With the computer providing artistic assistance, however, she even has sufficient time to add a few flourishes in contrasting fonts to the newsletter her husband, Larry, produces for his concert business each month.

EDUCATIONAL GRAPHICS AIDE

Darlene Fogal is an art therapist who works from her home in the country 15 miles outside of Spokane, Washington. She counsels emotionally disturbed children, whom she takes on referral from various agencies in the city. When she bought her VIC-20 three years ago, she thought of it only as an outlet for her own artistic whimsy, and that of her then 3-year-old son, Zeke. It didn't take her long to realize, however, that many of the graphic programs her son enjoyed could be well used, under controlled circumstances, in her work.

Unable to afford software at first, Fogal typed in programs from *VIC Games* and *VIC Graphics*, both by Nick Hampshire (Hayden Books), until she found three particularly suited to her work needs.

The results were better than she ever would have expected. "Art therapy helps kids express themselves through drawing," Fogal explains. "Sometimes they get stuck, though, and can't go on with crayons. But with a joystick, they think it's a game, and so open up. The buttons and machines are familiar to them from their experience with TV, and that helps them shed worries about expectations they think we might have of them."

One program Fogal uses frequently for this purpose flashes colors in changing screen patterns with accompanying sounds. By hitting the space bar, the child can freeze the frame, and then tell a story based on his or her interpretation of the pattern on the screen.

Fogal also relies on simple drawing programs to help the kids build hand-eye coordination and extend

their short concentration spans. Her sketching exercises use the joystick so the children can learn to relate the movement of the cursor to that of the joystick, and the pressing of the fire button to the freezing of a character on the screen.


As she has experimented with the computer's role in her work, Fogal has discovered commercial software, such as *FaceMaker*, from Spinnaker, simple enough for her students and yet challenging to her own and Zeke's artistic potential.

PICTURES WITH WORDS

Eric and Anita Bergh (both teachers in Pleasanton, California) often work together as a team: she as the writer, he as the computer-graphics buff. It was not until Anita became the editor of the Central California Council of Teachers of English quarterly newsletter that she began to take an interest in the graphics software her husband was so enthusiastic about. With Eric as her tutor, Anita learned how to design headlines using *Fontrix*, and print out filler graphics with *The Print Shop*.

"Prior to my taking on the newsletter," Anita explains, "there were set pictures each month that accompanied the columns. With *The Print Shop* I'm able to get much more variety. As for the headlines, if I didn't do them on the computer, I would have to blue-pencil them in on the layout and pay a typesetter to set them." With the typesetter savings, Anita could increase the size of the newsletter by about four pages an issue and still stay within her budget.

"When the Council Board saw the [revamped] newsletter, it wanted even more graphics," Anita explains. So the Berghs purchased *The Print Shop Graphics Library*, a data disk that contains 120 more graphic designs. The ready-made picture route is perfect for Anita's purposes. All she has to do is boot up the *Print Shop* program and then select the graphic she wants to print out. In 10 minutes she has the 10 pictures she needs for the newsletter, ready to be inserted within the text.

Though businesses have different requirements and personalities, there's not one that can't benefit from a jazzed-up newsletter or monthly report. Frequently, the successful application of computer graphics (and the positive feedback they generate) in one area of your work can lead to ideas for their use in other areas. And who knows, becoming adept at computer graphics might even further your career! 

FOUR STEPS TO CHOOSING THE RIGHT SOFTWARE

1. Assess the applications for which you will be using graphics in your work. Then decide what type of graphics fit those applications. Do you require charting to track changes in data; lettering and pictures for promotional materials; drawing for drafting or design; a combination? Further, decide how you will need to present your graphics: Will it be via printout, or will you be using your monitor (possibly in conjunction with a VCR) to deliver presentations?

2. Depending on the package you choose, determine what peripherals you will need. Is a printer a necessity? A color printer? (See "Buyer's Guide to Printers," in this issue.) A joystick, light pen, or drawing pad? Does your computer need a graphics card to render images, or a firmware board to transfer what is on-screen to the printer? (Refer to your local computer dealer or users' group, or call the customer service departments of software companies for help in this area.)

3. Evaluate your own artistic interest, and the time you have to spend on creating the graphics. Some packages are very easy to learn and use, others are more complicated though they may offer greater flexibility.

4. Consider other uses for the software: educational, family enjoyment, the work of other family members, etc.

Beagle Graphics, from Beagle Brothers, Inc. ([619] 296-6400), for Apple IIe/IIc, 128K w/DOS 3.3 or ProDOS; \$60. A sophisticated drawing and charting facility with programming options and preset

fonts. Slide-show feature built in.

Click Art series, from T/Maker Graphics ([415] 962-0195), for Macintosh; \$50 each for four disks. Designing and typesetting tool with different graphic sets on each disk.

Delta Drawing, from Spinnaker ([617] 494-1200), for Apple II series, 48K; Atari, 16K (cart.); C 64 (cart.); IBM PC/PCjr, 128K w/color graphics card; \$40 (disk), \$25 (cart.). Easy-to-use drawing program includes grid and charting options and built-in slide show facility.

Flying Colors, from The Computer ColorWorks ([800] 874-1888), for Apple II series, 48K; C 64; \$40, \$70 for Apple version w/printer capability. Straightforward drawing tool with programming feature.

Fontrix, from Data Transforms, Inc. ([303] 832-1501), for Apple II series, 48K; \$95; IBM PC/PCjr, 256K; \$155; 12 font disks, \$25 each. Complicated though capacious typesetting program with preset fonts and pictures; print-out capability.

Pfs:Graph, from Software Publishing Corp. ([415] 962-8910), for Apple II/II plus, 48K; Apple IIe/IIc, 64K; IBM PC/PCjr, 128K; \$125 (Apple), \$140 (IBM). Straightforward charting utility.

Prince, from Baudville ([616] 957-3036), for Apple II series, 48K; \$70. Picture package includes craft kits and easy-to-use print-out capability.

The Print Shop, from Broderbund ([415] 479-1170), for Apple II series, 48K; Atari, 48K; C 64; \$50 (Apple), \$45 (Atari, C 64). Easy-to-use drawing and typesetting program with imaginative preset pictures and option to create your own.

COMPUTING CLINIC

PRINTING APPLE GRAPHICS •

TANDY 1000's NEW BASIC

BY JEFFREY BAIRSTOW

I have an Apple IIc and an Image-Writer printer. How can I print graphics directly from the screen?

SHANE SEARCY

Pattonburg, Missouri

The ability to print out graphics is a function of both your printer and the software you're using. If you wish to print out character graphics from a BASIC program, you merely direct the screen display to the printer port with the command PR#1. (Under ProDOS, use PRINT CHR\$(4); "PR#1.") To print out hi-res graphics from BASIC is somewhat more complicated, and requires a program that reads screen memory.

Some programs, such as *AppleWorks*, allow you to print a "hard copy" of the character graphics on the screen at any time. Some graphics software, such as Broderbund's *Dazzle Draw* and Datasoft's

Micro Painter, and some of the new color printers, come with "screen dump" software to print out images you've saved to disk. For the Apple IIc with ImageWriter, try *Paper Graphics* from Penguin Software ([312] 232-1984; \$49.95), a screen-dump program that will print out any hi-res image you've saved to disk in DOS 3.3 format.

For the Apple IIe, there's a Print-It! interface card, from Texprint ([617] 449-5808; \$149 to \$199), which allows you to print anything on the screen at any time; you don't have to first save it to disk. With this card, you can even print on-screen graphics while a program, such as a game, is running.

The IBM version of *Algebra 1* (Peachtree/EduWare) I bought won't run on my Tandy 1000. Is this a color graphics problem, or will the new BASIC solve my problem?

LYLE L. SIMON

Nashville, Indiana

EduWare's *Algebra 1* is, in fact, written in BASIC for the IBM PC, which probably explains why it won't run on the Tandy 1000. According to Tandy, the new Tandy 1000 version of Microsoft BASIC will be available in August. The company claims it will clear up "99 percent" of the incompatibility problems with the IBM PC BASIC. When it's out, try calling technical support at DesignWare, which now handles *Algebra 1*, at (415) 546-1937.

Tandy pointed out two other incompatibility problems, one of which may answer your "color graphics" question. Since Tandy 1000 "thinks it's running in color all the time," you must configure all programs to run in color. The program should have a built-in option allowing you to choose between monochrome and color modes.

Second, programs that are "tight" on a 128K IBM PC probably won't run on a 128K Tandy 1000, according to Tandy, due to different memory requirements for the systems. **FC**

JEFFREY BAIRSTOW is a contributing editor for FAMILY COMPUTING.



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TELECOMPUTING

EXPLORING ONLINE DATA BASES

There's a Mountain of Educational Information Just a Keystroke Away

BY ANNE KRUEGER

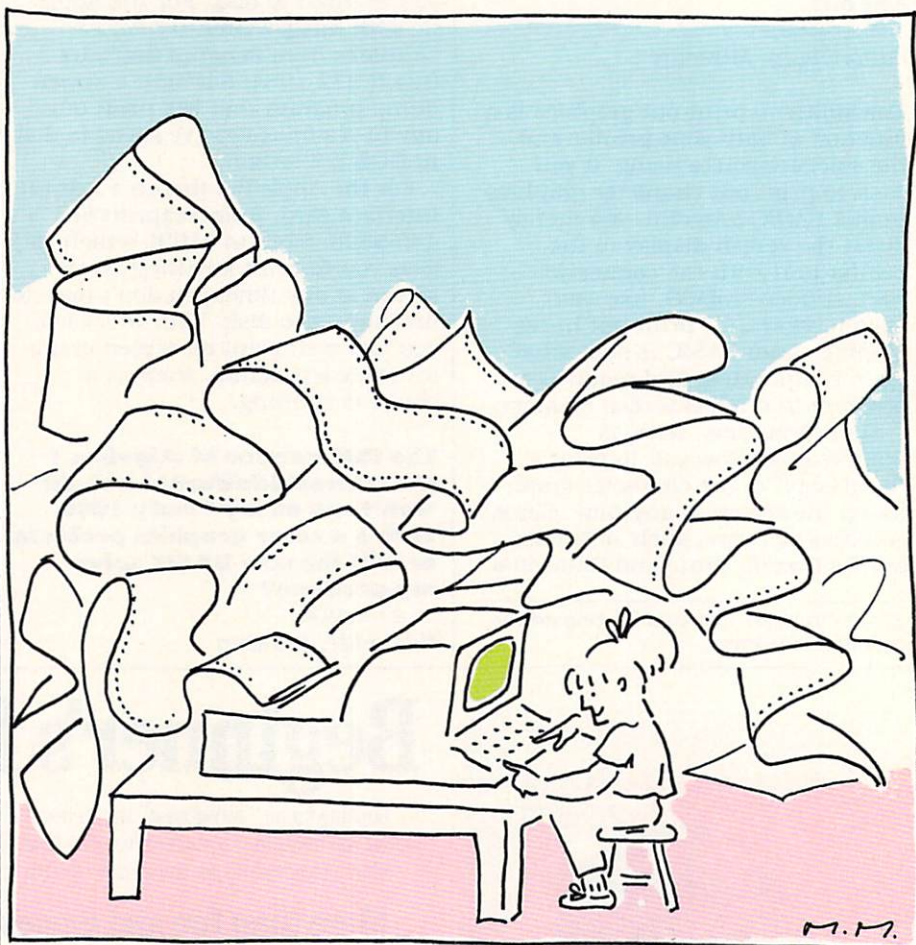
When sixth-graders at Flint Hill Elementary School (Fairfax County, Virginia) get a lesson in research, they don't sit in the library hunched over dusty volumes or the card file. Instead, these members of the computer generation access an electronic card file, of sorts. They follow current affairs, retrieve biographies of famous Americans, and study historical and scientific topics—all by using an online information network.

The class, called "Information Retrieval," is conducted by librarian Jan Rice as part of the school's ongoing computer literacy program. The eight- to 10-week unit was the brainchild of Principal Linda Clark, who got an introduction to telecommunications at a conference on education. She immediately thought of bringing the joys of telecomputing—the ease with which you can access mountains of information with just a keystroke—into the classroom.

CLASS GOES ONLINE

Flint Hill Elementary School soon discovered that telecomputing was a cinch: "We use an Atari 600, an acoustic modem, and the DIALOG information service," explains Clark. "I chose the DIALOG service because it offers a reduced \$15/hour online rate for educational purposes." Other popular online information services that offer data bases of interest to the lay person include The Source, CompuServe, Dow Jones/News Retrieval, Delphi, and NewsNet.

Explaining about the information-retrieval class (the only one of its kind in Fairfax County), Clark says, "Our school's computer literacy program extends from K through 6. By sixth grade we're teaching students to integrate computers into their research-skills studies. They learn to use the modem and basic online commands, use a data base, and conduct a search."



The students love telecomputing, according to Jan Rice. And once the kids got over the impulse to spend all their time accessing info about Madonna or other rock stars, the experience became both fun and educational.

"They would read about current affairs in the newspaper and then want to know more about them," Rice said. Students then would access DIALOG's UPI (United Press International) data base and track past and present national, international, regional, and state news. Students used UPI's FLASH, URGENT, or BULLETIN labels to identify which stories had news priority. Another way students narrowed down information was by searching stories by dateline (the city in which the event occurred).

For a lesson in using the WHO'S WHO IN AMERICA data base, Rice had last year's classes follow the 1984

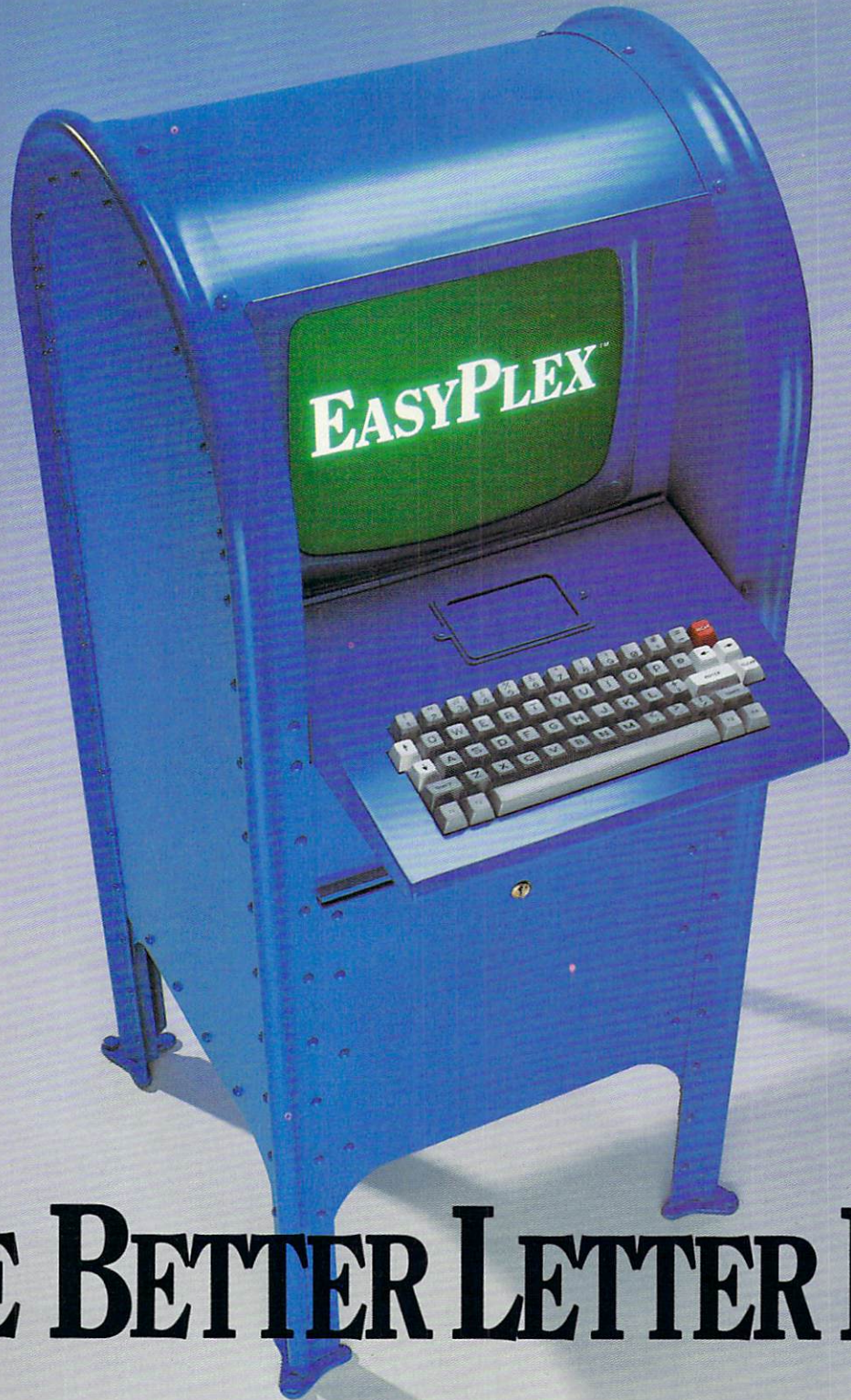
presidential and vice presidential candidates on the road, and research biographical information on them. They also used the BIOGRAPHY MASTER INDEX, which is a data base containing the births and deaths of prominent people. This data base provides only scant information but then gives users a list of printed biographies to turn to for more information.

"For practice, I'd give the class a problem such as 'What was Bill Cosby's dissertation?' They would learn to look for the answer to such a question in the dissertation abstracts section of the DIALOG service," Rice said.

Rice reinforces her research teachings with printouts of everything the students do online. "I'm trying to teach kids you *do* need bibliography skills and you *do* need to know how to read the date of publication, the

ANNE KRUEGER is a senior editor at FAMILY COMPUTING.

ILLUSTRATION BY MONA MARK



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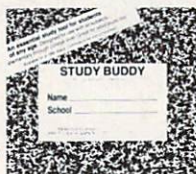
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TELECOMPUTING

DATA BASES FOR HOMEWORK HELP

Enterprising William Rice, 13, of Eden, New York, logged onto CompuServe last year for help with his homework. Deep in the throes of a term paper, he accessed the ACADEMIC AMERICAN ENCYCLOPEDIA data base for up-to-date information on the humanities, the arts, technology, sports—you name it.

"The information on the data base is a lot more current than the bound version of the encyclopedia," William explained. "Plus, you don't have to lift it up and turn the pages, lift another volume, etc."

The ACADEMIC AMERICAN ENCYCLOPEDIA (available via CompuServe, BRS, DIALOG, Dow Jones, and Viewtron information services) isn't the only data base of use to students. Here's a sampling of a few others which are fairly easy to use and understand:

Abstrax summarizes thousands of popular literature articles. Available via BRS.

American Men and Women of Science offers info on hundreds of thousands of scientists. Available via BRS and DIALOG.

America: History and Life provides info on such topics as U.S. Indians, women in American history, and much more. Available via DIALOG.

Biography Master Index pro-

vides info on such topics as U.S. Indians, women in American history, and much more. Available via DIALOG. publisher, etc. By looking at the printouts, they can sharpen their bibliography skills and also see where they may have gone wrong on a search. Looking at the printout clearly pinpoints where they should have used a different data base to find out about a certain subject, or used a different word to narrow the search."

Although students enjoyed the unit, they discovered the difficulties involved in pinpointing a topic. They found it frustrating, at times, to narrow down a topic. Rice pointed out, "The online information is sometimes very difficult to understand. While the ACADEMIC AMERICAN ENCYCLOPEDIA data base is very simple, most of the other data bases aren't student-oriented and can be extremely technical."

INFORMATION BECOMING LESS TECHNICAL

Data base information is often technical because data bases evolved to provide specialized information intended for specific groups: law-

vides the lowdown on historic figures and points you in the direction of print biographies. Available via DIALOG.

HealthNet offers the latest on health topics plus a built-in quiz. Available via CompuServe.

Magazine ASAP offers articles from more than 50 magazines. Available via DIALOG and Mead Data Central.

National Newspaper Index covers major news stories and columns from the *Christian Science Monitor*, *The Washington Post*, *The Los Angeles Times*, *The New York Times*, and the *Wall Street Journal*. Available via DIALOG and Mead Data Central.

NEWSEARCH contains bibliographic references to hundreds of current magazines, newspapers, and trade journals. Available via DIALOG.

United Press International (UPI) provides text of wire stories. Available via DIALOG, Dow Jones, NewsNet, The Source, and other services.

Washington Post Index highlights current news. Available via DIALOG.

Who's Who in America highlights prominent Americans. Available via DIALOG.

yers, brokers, engineers, etc. Currently, however, there are more than 1,500 online data bases and, with more in development, users can expect more user-friendly search procedures and menus, and easier-to-understand information. For a list of some of the most useful data bases for the enterprising student, check box.

Flint Hill Elementary School plans to continue its information retrieval unit of study. From experience, Rice knows that rambunctious students will barge in during the first weeks of the unit each year and claim, "Dial up this number—it'll get you into the Pentagon!" But she also knows by unit end, they'll have grasped just what can be done via online information services. And with nearly half of last year's sixth-graders owning their own computers, she knows that in the future this training will come in handy at home as well as in school. **FC**

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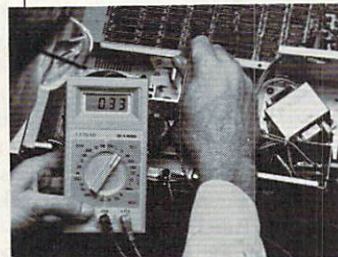
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GAMES

GETTING BETTER ALL THE TIME

A Sample of Some of the Best Games Around

BY JAMES DELSON

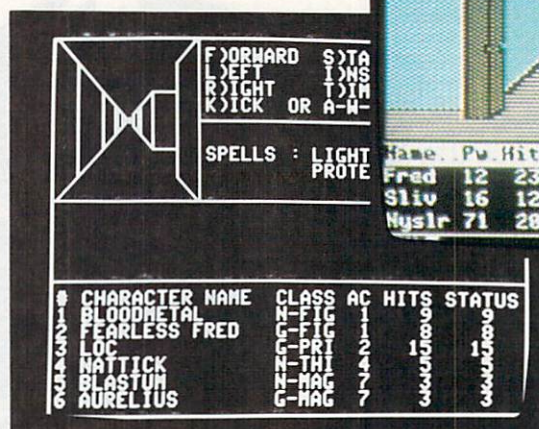
Believe it or not, reviewing games isn't always fun. Too many of the programs I receive simply try to duplicate past triumphs or to cash in on current fads. But from time to time, a truly exceptional piece arrives. It's these notable new programs that more than compensate for the clones.

Thanks to the efforts of top-notch game designers, computer artists, and their coworkers, groundbreaking programs continue to appear on the shelves—raising the standards of game design. Recent innovations have improved practically every game genre.

For instance, "construction set" technology is on the rise, allowing players to extend the play-life of their games (see "Make Your Own Computer Game," in the July FAMILY COMPUTING). Multiplayer adventuring, once restricted to four participants, has been enlarged drastically to include as many as eight or nine in *Field of Fire* (SSI; Atari, 48K; C 64; \$39) and *Shadowkeep* (Telarium; Apple, 64K; \$39). Text/graphics adventures and fantasy/role-playing games have come alive through the use of animated graphics, as in *Amazon* (Telarium; Apple, 64K; \$39) and *King's Quest* (Sierra; Apple, 128K; \$49).

The role-playing adventure field has seen more advances than any other genre. Fans of the three longest and most involved games, *Wizardry*, *Ultima*, and *Apshai* series, haven't had new scenarios to sample recently. But other game systems have emerged to challenge any sequels from the leaders.

The best of the lot, *Shadowkeep*, is a four-disk system that allows players to bring up to nine characters into an enchanted castle. You can operate each of the characters separately or guide the whole party as a group. Unlike *Wizardry*, in which monsters attack head on, assailants may pounce on one of your expedition's flanks or sides. Caught



FORWARD S>TA
LEFT I>NS
RIGHT T>IM
KICK OR A-W

SPELLS : LIGHT
PROTE

CHARACTER NAME	CLASS	AC	HITS	STATUS
BLOODMETAL	N-FIG	1	15	15
FEARLESS FRED	G-FIG	1	15	15
LOC	G-PR	2	15	15
NATTICK	N-TH	4	15	15
BLASTON	N-MAC	7	15	15
AURELIUS	G-MAC	7	15	15



Graphics then and now: Sir Tech's classic *Wizardry* and Telarium's state of the art *Shadowkeep*.

by surprise, your party may have to pivot to defend itself. Every character is vulnerable. Luckily, you can switch the characters' positions, even midway through battle.

All-color scrolling screens illustrating solid walls in *Shadowkeep* have replaced the black-and-white, 3-D line graphics in the *Wizardry* series that were once considered state of the art. Players can look around a room as if turning their heads or walk across the floor as the room's walls change in perspective.

HAIL TO THE HYBRIDS

Two new role-playing adventures feature a heavy dose of arcade fun. *Gemstone Warrior* (SSI; Apple, 64K; Atari, 48K; C 64; \$34) and *Sword of Kadash* (Penguin Software; Apple, 48K; C 64; \$34) offer players who enjoy nonstop sword and sorcery action a sophisticated quest. Known as hybrid games—mixes of two or more other genres—these games offer a chance for characters to grow as they explore vast labyrinths. Unlike the usual role-playing adventures that can take several months to complete, these challenges let you plunge into the game instantly.

Novices, or other players frustrated by the time it takes to develop a strong, sturdy voyager, will appreciate these hybrids. You don't have to spend a lot of time building up characters' traits and attributes as you do in many role-playing adventure

games. Just grab the joystick and shoot. A definite improvement over SSI's *Telengard*—the first of these one-player adventures—they offer superb animated graphics.

GOOD SPORTS

The top sports simulations boast some of the most advanced gaming technology. Gamestar is a major company that publishes the *On-Field* series (C 64; \$29 each)—tennis and football simulations for one or two players. In many sports games the joysticks merely manipulate players around the field/screen or select a limited number of plays. The Gamestar system, on the other hand, takes the play process several steps forward.

On-Field Tennis players use the joystick and fire button to alter angle and direction of serve, racket angle and power, type of return shot, and other variables. In *On-Field Football*, you must learn and perfect dozens of plays, formations, passing and running patterns, interceptions, kicking distances, fumble recoveries, and other moves.

Construction sets also have arrived on the sports scene, with Electronic Arts' *Racing Destruction Set* (C 64; \$32) leading the way. Players modify hundreds of different cars and off-road vehicles provided on disk, then race them on one of 50 racetracks, modify the tracks, or build new racecourses from scratch

FAMILY COMPUTING Games Critic JAMES DELSON makes it his business to track the best of the best.

\$99.⁹⁰ EARTHSHAKER



Crooning Titan

You'll experience melodious but thunderous sound at home or on the road from this bi-amplified audiophile portable with subwoofer, stereo enhancer and 5 band equalizer.

It's rich. It's deep. And it's powerful. This portable has the sound and features you'd expect from home stereo.

In fact, when you are at home or at the office, it makes a great second stereo system, with its rich expansive bass and vibrantly alive highs.

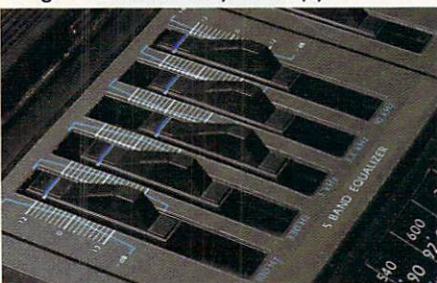
You'll have superb sounding FM stereo, AM and cassettes. And just wait till you experience the powerful bass supplied by the separately amplified subwoofer.

And that's not all. When you switch in the 'Stereo Wide' electronic enhancement, the 22" width of this portable seems to increase to 3 or 4 feet.

COLOSSAL SOUND

Forget boom box sound. Now you can have bi-amplified, equalized and enhanced sound wherever you are.

Most portables have 'Tone' controls or at best, bass and treble controls. Now you can turn up the bass at 100hz or the high end at 10,000hz without making a singer sound muddy or raspy.



The 5 band EQ lets you sculpture the sound just the way you like it at 100hz, 330hz, 1,000hz, 3,300hz, and 10,000hz.

The highs will be dramatically reproduced by a pair of clean piezo tweeters.

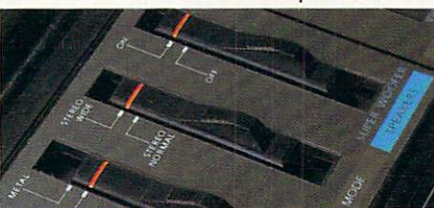
The mid-range and mid-bass is smooth and flat. It's produced by the outer mid-range/low-end speakers. But, wait till you hear the low bass.

Just switch in the separate electronically crossed-over amplifier and twin 'super woofers' to add earthshaking depth

and fullness to your music.

By separately amplifying (bi-amplifying) the low bass, and not letting it clip (overload) the left and right channel amplifiers, you can maximize the acoustical detail of your mid-range and high end sound while you bring your bass to life.

Because this electronic crossover allows some frequencies as high as 400hz to reach the separate amplifier and woofers, it may be pushing credibility to call these true subwoofers. But, you'll be amazed at the power, punch and tightness of the bass from this portable.



EVEN BIGGER THAN IT LOOKS

The speakers across the front provide a continuous 22" wall of sound. The woofers in the center don't effect stereo separation because very low frequencies are totally non-directional.

But, 22" isn't a lot of separation to really key into reality. So, there's a 'Stereo Wide Circuit'. When you switch in this circuit, it affects only the highs and provides the illusion of up to 3 or 4 feet of separation between the channels.

So, you'll have vibrant highs, massively powerful bass, a clean mid-range and great separation for just \$99.90. Wow!

ALL THE MUSIC

Powerful AM and FM tuners with a large slide rule dial let you pull in even distant stations. At home or away, you're going to have great reception.

The cassette deck allows you to record and play metal or normal tapes. It is direct-coupled to make great recordings from the built-in tuners or from its built-in mike. You can also plug in your own

external mikes. It also has one touch record, auto-stop and a tape counter.



You can operate this portable on AC (cord attached), by standard D batteries (not included), or by 12V DC from your car (cord not included). It's made by Unitech and backed by their limited warranty.

A CROONING TITAN RISK FREE

This silver-tongued music maker will amaze you with both its purity and its power. It's perfect for the bedroom, den, office or out in the yard.

While it's the ideal portable, it sounds so good at home you'll hate to take it on the road. If you're not 100% satisfied, simply return it in its original box within 30 days for a courteous refund.

To order Unitech's Crooning Titan Portable with 5 Band Equalizer, Bi-Amplified Subwoofer, and 'Stereo Enhancing Circuit' risk free with your credit card, call toll free, or send your check for DAK's earthshaking price of just \$99.90 plus \$7 P&H. Order No. 4316. CA res add tax.

Why be tied down to one room to listen to your favorite cassettes or radio stations? Now you can have really great sound anywhere in your home, your office or in the great outdoors.



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Gary's Revenge

We lost a battle. So now, just \$299 will bring you a front loading, Cable Ready, VHS video recorder with wireless infrared remote control and 14 day 4 event programmable recording.

By Drew Kaplan

We were embarrassed. We were upset. And, although we may have lost a battle, now we're going to win the war.

Last September we introduced a video recorder for Emerson that we thought would scoop the market. Well, by December, our scoop was being scooped.

And when DAK gets scooped, we don't just apologize, we pay. If you buy anything from us and find it advertised for less within 30 days, just send us the newspaper or magazine ad and we will issue you a merchandise credit.

So, by December we were really licking our wounds and plotting our revenge. Enter Gary, Emerson's Western Regional Sales Manager. Gary brought us the original recorder, for a very good reason.

Many of DAK's sales are in the Midwest and East, so we can sell tens of thousands of recorders without bothering the rest of his Western Region.

And, that's good for Gary because it makes his sales look real good at the expense of the Midwest and Eastern Regional Managers.

So, this time Gary has brought us a recorder **we think can't be beat**. With its 105 channel cable ready capacity, its wireless eleven function infrared remote and DAK's \$299 price, we challenge anyone to compete.

But, before we examine just what this 4th generation, **Japanese crafted** video recorder can do for you, let me share 3 real life reasons why you really should own any video recorder.

THE HARRIET FACTOR

Harriet is my wife's old team teaching partner. She had never had a video recorder. So, we gave her one. Several weeks later she called, absolutely elated.

She was recording The Phil Donahue show every day and watching it when she got home from school. She had also recorded several movies on cable that she kept missing while she was at work.

My parents are another story. They've

had a recorder for years (being my parents has its advantages). My parents have two loves, concerts (my mother is a concert pianist), and UCLA Basketball.

They go to concerts several nights a week and tape the UCLA games while they're out. Then if you can believe this, they make popcorn and stay up to watch the game till 1:30AM. Anyway, they just love their recorder.

Finally we have my wife's parents. **And this is really important.** We gave them a recorder and they didn't know how to hook it up. It never occurred to me that there was anything to hooking up a video recorder.

Just unhook the antenna from your TV and connect it to the recorder. Then connect the cable (included) between the recorder and your TV, and record.

Anyway, my father-in-law gets up at about 5AM, so they go to bed very early. Once they hooked up their recorder they discovered a whole world of late night TV. Now they watch Dynasty during dinner. And, look at this. They had never stayed up to see the Johnny Carson show.

Wow, a video recorder can let you watch what you want when you want without being restricted by your work, social life or sleep.

If you're like me, you probably won't tape and save. There aren't many movies that I want to see more than once or twice. But, wait till you see how convenient it is to plan your viewing hours to fit your own schedule.

LOOK AT ALL YOU GET

From the moment you put a video cassette into the front loading motorized slot and see it automatically drawn into the recorder, you'll appreciate the quality.

ELECTRONIC TUNING. This recorder's synthesized tuner can tune in VHF channels 2-13 and UHF 14-83. Plus, you'll also be able to tune in 23 Mid Band and High Band Cable Channels.

You can choose any 12 channels from any band in **any order** you like for instant

one touch tuning at the recorder, or step through them from the infrared remote. **4 EVENT/14 DAY PROGRAM CAPABILITY.** You can select any 4 programs over a two week period to record.

So, if you're going on vacation, you can keep up with weekly series while you're gone, even on different channels.

The timer is extremely easy to use. You'll record shows you miss when you're out, shows that you want your children to see at a more appropriate time and important events that you'll want to keep.

Plus, you can watch one show on your TV while you record another.



WIRELESS INFRARED REMOTE.

From system power to changing channels, you're in full control. If a remote seems to simply smack of posh luxury, look at what it can do for you.

You can touch the still frame button and freeze the action. Now you can really tell if the umpire was correct or not.

You can play the same movement over and over again until you are absolutely sure of what you've seen, while you relax

Next page please. . .

... Gary's Revenge Continued in your favorite viewing chair.

If you want to find a certain part of the tape, use the high speed forward or reverse scan to 'visually' fast forward or rewind.

AND MORE. There's a digital clock/timer and even a tape counter. LED's show all the functions. And, there's even a picture sharpness control.

There are both high and low speeds for up to 8 full hours of recording. And finally, when a tape reaches the end, it will automatically rewind.

It's made by Emerson. And, it's backed by their standard limited warranty.

WHY THIS RECORDER

Other than its super features, great picture and DAK's revenge pricing, there are 3 reasons to choose this recorder.

1) With a cable ready recorder you can watch one cable show and record another. 2) By using the tuner in this recorder, you'll turn any TV into a remote control Cable Ready TV. 3) You may not have cable yet, but when it comes to your area you won't need a new recorder.

ENJOY VIDEO FREEDOM RISK FREE

Wait till you experience the freedom of watching any program **when you want.**

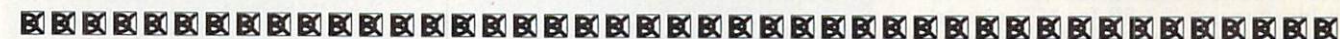
Wait till you see how easy it is. If you're not 100% satisfied with the

incredible picture quality or the automated functions, simply return it in its original box with 30 days for a refund.

To order your Emerson 105 Channel Cable Ready VHS Video Cassette Recorder with Wireless Infrared Remote Control risk free with your credit card, call toll free or send your check for DAK's breakthrough price of just \$299 (\$9.50 P&H) Order No. 4215. CA res add tax.

Now you can watch last night's midnight show at dinner, or tonight's dinner show at midnight. And, thanks to Gary's Revenge, you can do it for just \$299.

PLEASE USE ADDRESS AND PHONE AT BOTTOM OF PAGE



Unleashed TV/Video Sound

Now you can do for your ears and brain what color TV has done for your eyes, with Universal's new amplified and electronically synthesized stereo system for your TV and video recorder.

It's amazing. TV sound is really great. It is actually broadcast on the FM band.

In fact, **every one** of the great sounding FM stations from FM 88 to 108Mhz that you enjoy listening to on your stereo system, is tightly sandwiched between channels 6 and 7 on your TV.

So, why do TVs sound so crummy? Well, if you compare a \$1000 stereo system to even the best \$800 TV, you'll realize that when you bought your TV, all that was probably discussed was the picture quality, sharpness, and color purity.

The truth is that in most TV sets, all the money goes into creating the best picture quality, and the sound is left to a cheap amplifier and a 3-5" Low Fi speaker.

POWER FOR THE VIEWER

Think about the bigger than life realism that enwraps you at a movie theater. It's called 'Sensory Emotional Involvement'.

The experience is a combination of the big picture and massive sound that together subconsciously cause your brain to register reality. Of course, you know it's not real (I hope), but subconsciously you have to keep reminding your brain.

It's the combination of sight and sound in tandem that act on your brain. And, it's the reason that even with a great TV picture, a single 3-5" speaker may sound loud, but it won't thunder. It may be soft, but it won't whisper.

And most important, with all the sound coming from just one point, your brain doesn't get any reality cues.

Now, without changing your TV, you can dramatically enhance the realism and sound quality by creating moving sonic cues which your brain will equate as movement in the picture.

Then you can add great fidelity with a pair of two-way specially shielded die-cast aluminum speaker systems with real woofers and tweeters.

And finally, provide enough amplified power to make a car chase come alive or an organ thunder. So, movement, fidelity, power and picture, equal reality.

SIMULATED STEREO PLUS

In a world where our brains are attuned to the sonic impact of stereo music, nothing turns off the feeling of reality more quickly than a single sonic source.

You get two different signal processing choices. Just running your TV signal to two speakers and amplifying it will increase the fidelity dramatically, but it

won't make the sound come alive.

The signal has to be altered. And, with Universal's new Amplified System for your TV or Video Recorder, you can select either of two realism enhancers.

When you switch to 'Simulated Stereo', you will be dividing and sending sonic data from about 500hz to 3,000hz to the sides of your room. These critical frequency areas largely determine where your brain perceives sound is located.

When you switch to 'Stereo', you will be altering the 'phase sensitive' elements of the entire musical spectrum.

This will tend to give you a wider, fuller sound for music. So, if your eye sees movement as a scene unfolds, and your ear senses movement or width of sound, your brain equates realism.

The Speakers. Twin two-way speaker systems with a wide frequency response produce simply vibrant sound. You'll hear sounds that you never knew existed.

You'll hear footsteps creak and doors open as your sound takes on realism. And, string basses, violins, and trumpets will emerge from the murk.

The Amplifier. Connect the two-way speakers to the amp (cables included). Then connect a cable (included) from the amplifier to either your TV's earphone jack (plug included) or your video recorder's output jack and get ready for a shock. Universal's Amp has built-in ANR auto-

matic noise reduction circuitry which cuts out hum and noise caused by TVs without sacrificing the high end. So, you'll have sonic placement, rich full sound and virtually no annoying noise.

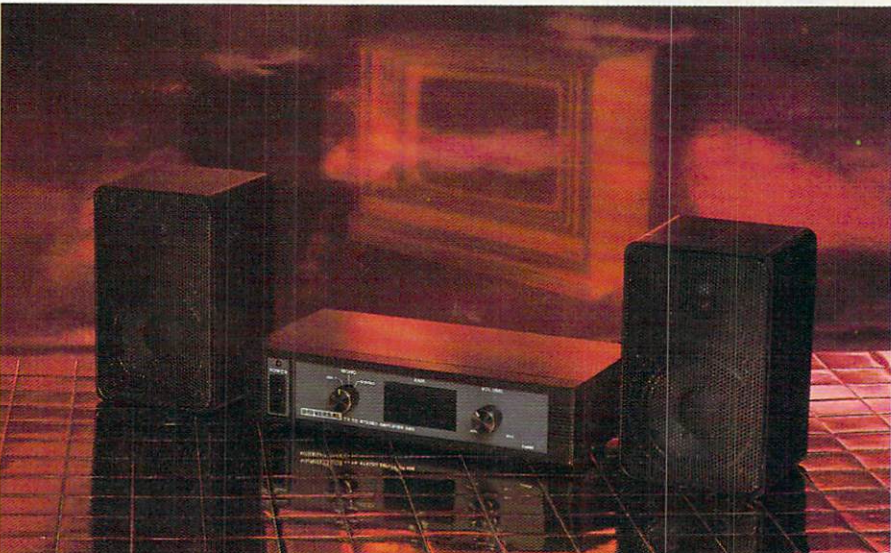
It's made by USI, a leader in electronics since 1969. It's backed by their standard limited warranty.

UNLEASH YOUR TV'S SOUND RISK FREE

In your living room, bedroom or kitchen, now you can have really realistic, emotionally charged sound for your TV. If you're not 100% satisfied, simply return it to DAK in its original box within 30 days for a courteous refund.

To order Universal's Amplified Synthesized Stereo System complete with Two-Way Speaker Systems risk free with your credit card, call toll free, or send your check for DAK's breakthrough price of just \$79.95 plus \$6 for P&H. Order No. 4241. CA res add tax.

Now you can add rich sound and realism to your TV for just \$79.95 Wow!



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Top Typer \$79 Close-Out

Here's an all electronic typewriter that operates on AC or batteries, plain or thermal paper, by typing on its full size, 132 character keyboard or connecting it to your computer. I just bought one for \$249, but it's yours for \$79.

By Drew Kaplan

It goes where you go. It self-corrects errors. And, it's almost totally silent. For writing letters at home, for students writing reports or for writing 'on the road', this 5 pound electronic marvel really puts out the written word.

You can type on ordinary smooth paper using carbon ribbons (three 18,000 character ribbons included). Or type directly on inexpensive (\$3.50 for 100 sheets) thermal paper without using ribbons.

In June, on a trip home from Chicago, I saw and bought this exact Silver Reed machine, in beige rather than black, from an Airline Magazine for \$249.95. (We have a copy at our store.)

It came packed with 200 sheets of thermal paper and 4 D batteries. For DAK's \$79 price, you get the AC power supply, 10 sheets of thermal paper, 10 sheets of plain paper but no D batteries. Wow, that's about a \$160 saving.

LOOK AT ALL IT DOES

It's only 12½" wide, 9½" deep and 2" high. Yet its keyboard has identical spacing to an office typewriter.

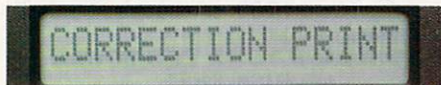
Plus, there aren't many office typewriters that can boast a built-in capability to print 132 different characters. It's the perfect machine for reports or letters.

It has electronic margins you set by simply touching buttons. You can set up to 16 tabs on a line, and you can select 1, 1½ or 2 line vertical spacing.

There are even incremental spacing buttons that move the paper forward or reverse. The typewriter handles paper up to 8½" wide and types a 7½" line.

SELF CORRECTION

There are three typing modes. You can 'Direct Print' which types the letter on the paper as you strike the key, just like a conventional typewriter. You can use 'Correct Print', which allows you to type 15 characters before the typewriter starts typing the letters on the page.



In 'Correct Print', you can change letters, words or anything you like when you see an error on the bright LCD display with an electronic contrast control.

This allows you to see what you type before it's permanently typed. They call this word processing, but as a computer hobbyist, I just call it convenient.

Finally, you'll have a full function calculator. You can lay calculations right into your written text or switch to Non-Print.



2ND SHIFT AND MORE

In addition to the regular keyboard, there's a second keyboard with its characters shown above each key. It has useful characters such as ±, °, and foreign



language symbols. Please look below, because the typesetter setting this ad can't reproduce all the symbols.

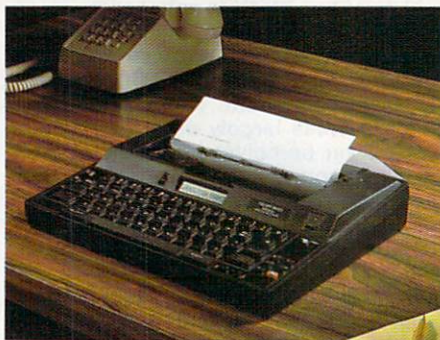
It also has a 'Repeat' key that lets you infinitely repeat any character.

DON'T BE MAD COMPUTER INTERFACE

Wow, just think, a machine that is sophisticated enough to work with your computer for just \$79. Unfortunately, its interface still costs \$69. But please remember, it was/is a \$249 machine.

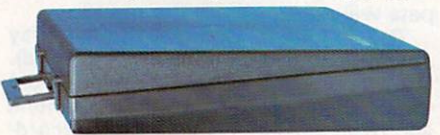
Anyway, there's a port that allows you to add Silver Reed's external interface. You'll also need a standard parallel interface in your computer.

You'll have a computer printer with an 11 character per second printing speed. Each clear sharp character is made from a 16x10 dot matrix grid for good looking, super readable type.



HERE AND THERE

This electronic typewriter is quiet enough to let you type in a library. With its hard protective case (included), it's tough enough to drag to the beach. It's a simply perfect gift for anyone who has to write college or high school reports.



You can type in a mountain cabin or at the kitchen table. Now you can have great

looking reports and letters anywhere.

As I said above, the letters are formed by a top quality 16X10 dot matrix print head. (Many cheap printers have only a 5X7 grid.) You'll have both upper and lower case letters.

But even so, if you want 'presidential letter quality' such as I need coming from my office, you probably need a \$1000 IBM, not a 'computer type' printer.

And, don't forget you'll get the best quality printing from thermal paper or from very smooth 'copy type' paper.

But, you'll love the versatility, ease and low operational cost of this incredible innovation in typing. It's backed by Silver Reed's standard limited warranty.

TRY REALLY PORTABLE TYPING RISK FREE

Wait till you type a letter. Your entire family is sure to love this rugged machine.

If you're not 100% satisfied, simply return it in its original box within 30 days for a courteous refund.

To order your Silver Reed All Electronic Typewriter, complete with AC adaptor, 3 Ribbons and 10 Sheets each of Thermal and Plain Paper risk free with your credit card, call toll free, or send your check, not for the \$250 suggested retail.

Don't even send the \$125 printed on the dealer cost sheet. Send just \$79 plus \$5 P&H. Order No. 4318.

You can order 100 sheet packs of thermal paper for only \$3.50 (\$0.50 P&H) Order No. 4319. Or packages of 4, 18,000 character carbon ribbons (72,000 character total) for just \$7.50 (\$0.50 P&H) Order No. 4320. The computer interface is \$69 (\$2 P&H) Order No. 4321.

This typewriter was impressive at \$250. A totally electronic typewriter that goes where you go for \$79, will sell out fast.



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**MARKET
BUSTER**

Sound Blaze

Like the blazing flash and violence released by a lighting bolt striking earth, your stereo system's sound will explode with life. With a 98db signal to noise ratio, a 95db dynamic range, and a 5hz to 20,000hz frequency response, Emerson's new fully programmable CD player is sure to stagger your perception of audio.

By Drew Kaplan

There's no warning. There's no record noise, no tape hiss. Vibrant but finely detailed music just explodes from your stereo system. The sound is like a shock-wave reverberating through your home.

This is the experience you can expect with your first introduction to digital audio. Forget any experience you've ever had before with stereo. CD audio is an awesome advance that dwarfs the switch we made years ago from 78s to LPs.

Imagine listening to music with a frequency response from 5hz to 20,000hz +0.5db -1db. Wow! Imagine sound so pure that harmonic distortion is just 0.003%. And, if you're into zeros, flutter and wow is "unmeasurable".

The sound quality, and yes, the sonic violence will thrill you. I've spent over 15 years on the test bench and in the studios, and the only equal I've heard to this sound is 'live sound'.

And, live sound doesn't mean the sound you hear at a concert where you are simply listening to the auditorium's PA system. Live sound means sitting right in the middle of the orchestra.

I know, I'm a cellist. And, there's just no sound experience like the sound we hear in 'the pit'.

NO SOUND AT ALL

CD gives you a signal to noise ratio of 98db. There is, for all intents and purposes, absolutely no hiss, no scratch, and best of all, no surface noise.

You've got to experience the silence during very quiet passages to comprehend the sonic adventure of the music. It's as if your stereo isn't even on and then, suddenly, a thunderclap explodes!

Conventional records and tapes have a dynamic range of perhaps 50db. Dynamic range is simply the difference in sound level (volume) between the softest and loudest recorded sounds.

CD gives you a 95db dynamic range, which is roughly equivalent to the difference between absolute silence and standing next to a jet engine.

Your music will be dramatically more exciting. You won't have to carefully compare CD to conventional sound. From the very first note, you'll be in shock. It's as if the world was just created and you

are listening to newly born, virgin sound.

NOT PERFECT?

CD isn't perfect. Or rather, it is, and that's a problem. You'll hear everything. You'll hear every note, every instrument, as if you were sitting in the orchestra.

When CD first came out, there were three complaints. 1) It could sound harsh or hard. 2) There weren't enough CDs released. 3) Not all CD discs were really recorded digitally. **Here are the answers.**

1) Early discs did sound harsh. A characteristic of pressing LPs is that they drop off from 5-10,000hz, so recording engineers tend to boost those frequencies when they mix master recordings.

A few slight cuts with an equalizer bring the first discs back to super smooth sound. The laser disc has a perfectly flat response, so whatever is on the master, won't be masked when you play it back.

2) True again. CDs were in short supply and not many titles were released during the first few months. Now there's a virtual avalanche of thousands of titles, and more are being released weekly.

3) True again. Not all CDs come from digital masters. CDs from digital masters can sound phenomenally better than a conventional LP. (It's earthshaking.)

But, when analog (conventional) masters are recorded in the studios, they are recorded on two inch wide tape at 15 inches per second. They sound great.

Most sound quality is lost in pressing records and copying cassettes. A CD from an analog master isn't quite as good as from a digital master, but its superiority over an LP is still like day and night.

CDs are now a standard format. There's no stylus to wear out and the disc doesn't wear out because nothing touches it.

WHY EMERSON?

This CD disc player is the latest Japanese made second generation, type.

It has a 3-beam, laser servo system with heavy sampling for superb sound. Plus, it's loaded. You can select up to 9 tracks in any order you like. Then, just sit back and enjoy the sound. There's even a repeat button. So, you can repeat your selected tracks or the entire disc over and over again, forever.

Just touch a button and you can skip to the next track during play, or repeat

the track you are listening to. You can even playback indexed passages within a track. A display shows you the track that is playing, the elapsed time, or the total time of the disc.



Installation consists of simply plugging it into any 'aux' input on your receiver or preamp, nothing special. It's backed by Emerson's standard 1 year limited warranty.

TRY EXPLOSIVE SOUND RISK FREE

Plug it in. Experience music with a thrilling frequency response and sonic range. Plus, you'll be thrilled by the hiss, and background noise you won't hear.

If you're not 100% satisfied, simply return it to DAK within 30 days in its original box for a courteous refund.

To order Emerson's Fully Programmable CD Disc Player and experience the sonic thrills of a lifetime, call toll free, or send your check for DAK's **market breaking price**, of just \$178 (\$7 P&H). Order No. 4304. CA res add sales tax.

It may strain my credibility to describe any device I'm offering for only \$178 as providing sound many times better than anything you've ever heard before. But, use DAK's risk free trial to experience this bigger than life sound for yourself.



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\$129 PRICE EXPLOSION



\$5 Bonus Word Processing **Apple IIE & IIC, IBM PC, And Commodore 64**

Forget complicated programming. If you can hunt and peck on a typewriter you can turn out flawless reports and letters with your computer in minutes.

And if you want to fix a mistake, or if you want to improve a sentence, it's just \$5 and a push of a button away with DAK's new Bonus Word Processing Programs available with Purchase of this printer.

The Complete Computer

Let your computer print letters or reports for you on plain paper at 50 characters per second. You can use this dot matrix printer with virtually any home or office computer. It's incredibly easy to use. And, it's built tough. Plus, it even prints graphics. ~~Price Slashed to \$129.~~

By Drew Kaplan

Energize your computer. From writing letters to listing programs, your computer can be phenomenally more useful when you use this printer.

It uses plain paper and it's super reliable. It prints both upper and lower case characters. And, if you aren't using a printer with your computer, read on.

LISTING/INDEXES/LETTERS AND MORE

Experience the thrill of actually writing your letters and reports on your computer. Now you'll be able to use all of your computer's word processing and **correcting** capabilities to really explore your creative talents.

I can't overemphasize the convenience of never having to retype a letter or a report because you find a misspelled word or a sentence you'd like to change. Or, think of how easy it will be to sort out a problem in a program when it's on paper.

And, DAK's new \$5 Bonus Word Processing Programs are so 'user friendly' that you can learn to use them in just about 10 minutes.

You can change a line, move a line or save a file. It's all just a push of a button away. This printer and any word processing program can release the real power of your computer.

Programming is fascinating, games are fun. But, a risk free 30 day in-home trial of this computer printer should

really show you just how much your computer can really do for you.

PERMANENT RECORD

If you have a modem, you're in for a treat. You can access encyclopedias, stock market reports, and much more.

With a printer, you can get a 'hard copy' of all the incoming information. You can get everything from SAT test simulations and IQ tests to loan amortization schedules and Airline flights.

And, you won't have to load a bunch of disks to find a program when you print out a menu for each of your disks.

AFRAID OF PROGRAMMING?

You don't need to know the first thing about programming to use this printer. Now, using a computer word processor is as easy as typing on a typewriter.

LOOK AT ALL IT DOES

An ad in several computer magazines listed a \$149 thermal printer (that needs expensive thermal paper) as the lowest priced printer in the U.S.

Imagine a 50 character per second dot matrix printer that prints a full 80 column (80 characters) wide line. Plus, it has a built-in standard Centronics Parallel Interface.

This printer handles plain old cheap standard fanfold pin feed computer paper from 4.5" to 9.5" wide, with its built-in adjustable tractor pin feed drive.

It's so powerful you can even use two-part forms for a carbon copy. Plus, there's

an impact control for print darkness.

It understands and prints 116 upper and lower case characters, numerals and symbols. And that's not all.

You can even print Double Width characters. And, look at this. This printer has full graphic capabilities with 480 dot horizontal resolution and 63 dot per inch vertical resolution. So, you can print out your pictures, pie charts or graphs.

Just like a typewriter, it prints 10 characters to the inch across the page and six lines to the inch down the page.

When hooked to your computer, you'll never have to retype anything again. Just make the correction and let the computer retype your work for you.

The printer is made by C. ITOH/Leading Edge in Japan. It's built to really take heavy use. And it's backed by Leading Edge's standard limited warranty.

It takes standard long life inked ribbon cassettes that are readily available nation-wide. This is a printer that will give you many years of continuous reliable service and enjoyment.

AND NOW THE BAD NEWS

If you're the president of a large corporation, sending important business letters, you may want a \$1000 daisy wheel printer. But for most uses, dot matrix printers are incredibly faster, and there isn't any way to print out a graph or picture on a daisy wheel printer.

But, there are two things you need to

know about this printer. First, it has about the dumbest name I've ever seen. It's built tough and rugged. So, they named it The Gorilla Banana Printer.

Second, like many dot matrix printers, the letters g, j, p, q, and y are level with the other letters. Each letter is completely and perfectly formed, but each sits level with the rest of the alphabet.

Upper case letters and symbols are unaffected. So, if you don't want letters that look like they were printed by a computer, this printer isn't for you.

But for most letters, term papers, reports, or programming it's perfect.

COMPATIBLE COMPUTERS

Any Computer with a standard Centronics parallel port, such as: Apple, Franklin, IBM PC, TRS80, Osborn, Atari, Commodore VIC 20, Commodore 64, Kaypro, and virtually any other personal computer. Plus, most briefcase portables.

FEAR OF INTERFACES?

Your computer is smart. But, it doesn't know how to 'talk' to other devices. That's why you need an interface.

An interface isn't just a cable. It's actually an intelligent translator that lets your computer talk to other equipment.

Usually, the computer manufacturers don't include the various interfaces when you buy your computer because they don't know if you'll ever add peripherals, such as disk drives, printers or modems.

So, rather than sell you something you don't need, you don't buy an interface until you add onto your computer.

There are two types of printer interfaces. The first allows you to do text word processing. For 99% of computer use, this is all that is needed. It translates all the possible letters and punctuation known as ASCII.

A second type of interface also allows you to dump pictures or graphics from your screen or memory. This is more complicated because each individual dot must be told where to go. This interface, or 'driver program' as it is called, is available in two forms: built into an interface, or as a program on a disk which you use with any standard interface.

Either way, you'll have the printer operating in just a few minutes. And if you already have a printer, the same Centronics parallel interface and cable (about 85% of all printers are compatible) should work with this printer.

WHY SO CHEAP

A new model will emerge soon with a different name. Leading Edge had just 28,000 of these remarkable printers which have been selling at discount for as little as \$199, left in stock.

DAK bought them all for cold hard cash. And now we're offering them to you for less than the original price we were quoted as wholesale.

The printer is approximately 16½" wide, 9" deep and 7" tall. It's backed by Leading Edge's standard limited warranty.

ADD PRINTING POWER TO YOUR COMPUTER RISK FREE

Now you can really make your computer work for you. Now you can print out your programs, your reports, your notes and your letters.

If you're not 100% satisfied, simply return the printer, and any accessories and bonuses in their original boxes to DAK within 30 days for a refund.

To order your 50 Character Per Second Dot Matrix, Plain Paper Printer with a built-in Centronics Parallel Interface, risk free with your credit card, call toll free, or send your check for the breakthrough close-out price of just \$129 plus \$8 for postage and handling to DAK. Order No. 4101. CA res add 6% sales tax.

Note: If you need a serial printer for a computer, such as the TRS80 Color Computer or Apple IIC, order the identical printer with a built-in Serial Interface for the same price. Use Order No. 4102.



PRICE SLASHED
DAK sold over 15,000 for \$129
NOW JUST \$89.90

Use Order Nos. 4101 or 4102 plus (\$8 P&H)
Don't let the low price fool you. This is a rugged, reliable printer that you'll use for years. If you have a computer without a printer, it's likely to end up in the closet.



With this printer you can alter your graphics as you desire. You can print normal or reversed (both shown above, greatly reduced to fit in this catalog) and you can even print double size.

The Printer comes packaged with a long life ribbon. Extra ribbons are available at computer stores. DAK has them for \$4 each (\$1 P&H) Order No. 4103.

Standard Centronics Interfaces for your computer are available at any computer store. This Printer has its receiving interface built in. You simply need one, complete with its cable, to plug into your computer 'to send' information. Below are our favorites for 5 of the most popular computers.

FREE FREE FREE FREE

No big deal, but we're adding 10 sheets of standard 8½" X 11" continuous form paper to your order. It's worth less than 10 cents, it's available everywhere, and it's yours to keep but it will let you try out your new printer the moment it arrives.

SUPER BONUS \$5 WORD PROCESSING

We have powerful bonus word processing programs for \$5 with editing, including changing a line, moving a line and saving a file.

While you can choose just about any word processing program to energize this computer printer, DAK has developed incredibly easy to use programs for several popular computers.

If you own an IBM PC, an Apple IIE, an Apple II or II Plus with an 80 column card, the new Apple IIC or a Commodore 64, \$5 will bring phenomenal power to your computer. Just use the Order Numbers below.

If you own any other type of computer, standard word processing programs are

available at any local computer store.

For your Apple II, II Plus or IIE. We have Practical Peripherals' text interface for just \$49 (\$2 P&H) Order No. 9877. We have their graphics capable interface for just \$79 (\$2 P&H) Order No. 4104. If you already have a Centronics Parallel Interface, we have a graphics driver program on disk for just \$7 (\$1 P&H) Order No. 4105. Just add \$5 (\$1 P&H) Order No. 4217 for the Bonus Word Processing Program on disk.

For your Apple IIC, you have two choices. It has a serial output, so all you need is a cable for just \$18 (\$2 P&H) Order No. 4224 for text word processing. (Order the Serial Printer No. 4102.) If you wish to produce graphics as well as text, we have a special interface that converts the IIC to Centronics Parallel. Use it with its included graphics driver disk and you can produce text or graphics for just \$69 (\$3 P&H) Order No. 4225. (Order the Parallel Printer No. 4101.) Our Bonus Word Processing Program is a perfect companion to either printer for just \$5 (\$1 P&H) Order No. 4217.

For your IBM PC, you don't need an interface. It's usually already built in. But, you do need a cable. We have a cable, ready to connect this printer to your computer, for just \$19 (\$2 P&H) Order No. 9879. We have a graphics driver program on disk for just \$7 (\$1 P&H) Order No. 4106. Just add \$5 (\$1 P&H) Order No. 4218 for the Bonus Word Processing Program on disk.

For your Atari 800, 800XL, 400, or 600XL, we have a text interface for just \$69 (\$2 P&H) Order No. 9881. We have a graphics driver program on disk for just \$7 (\$1 P&H) Order No. 4107.

For your Commodore 64 or VIC 20, we have a text interface for just \$39 (\$2 P&H) Order No. 9883. We have a Graphics Interface for just \$54 (\$2 P&H) Order No. 4108. Just add \$5 (\$1 P&H) for the Bonus Word Processing Program for the 64 only. Order No. 4122 for Disk, or No. 4123 for Cassette.

For most TRS80 Computers, you don't need an interface, just a cable. For the Black and White Computers, we have a Parallel Cable for just \$18 (\$2 P&H) Order No. 9885. For the Color Computers we have a Serial Cable (you need the Serial Printer as well) for just \$18 (\$2 P&H) Order No. 4109.

For briefcase-type portables, the Centronics Interface is usually built-in. Just stop by any computer store. All Centronics Printers use the same cable at the printer end, but you'll need a cable that fits your particular computer's plug.

Get hard copy print-outs of your programs or your graphics. Turn your computer into a powerful word processor. Forget retyping ever again. For just \$129 you can make your computer complete.

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Mind Manipulator

Once you've got frequency response, signal to noise ratio and dynamic range whipped, the difference between the sound of your home stereo and the excitement of 'being there live' is all in your head.

By Drew Kaplan

You're no dummy. Close your eyes. Have someone make noises in different parts of the room you're in. You'll have almost no problem determining exactly where each sound was made.

The reason you can locate the sound so easily, is that your brain interprets the incredibly small micro-second differences between the time the sound reaches your right and left ears. Your smart brain continually 'tests' the sound.

TOO SMART

So, when we all lived in the jungle and relied on sound placement to stay alive, we survived. When we heard lions to the left or tigers to the right, we knew which direction to run.

But when you listen to your stereo system, your brain keeps doing the job it was intended to do. It accurately 'locates' your two speakers.

Unfortunately, too much sound is pinpointed and localized by your brain. Plus, many of the brain's natural location cues are lost in the recording process.

LOST IN THE CROWD

With so many sounds coming from the two relatively small distinct speaker points, the sound can be muddy, unrealistic and lack live presence.

In a live concert, you are exposed to a wide field of sound, with each instrument coming from a different location.

While stereo does 'spread' the sound, it lacks the 3 dimensional quality that it would have in a field or at a concert.

ILLUSION

Now from BSR comes a way to manipulate your brain into recreating the perception of a wide 'soundfield'.

Imagine sitting in front of a stage with an orchestra spread out before you. Now imagine the widespread realistic sound you're about to enjoy in your own home.

BSR, utilizing the latest solid state components, the latest hearing research and some innovative designing, is about to paint a panorama of sound throughout your listening area.

There's no change in frequency response. There's no change in distortion. But, wait till you hear the improvement in width, height and depth of your music.

HERE'S HOW IT WORKS

Normally you hear sound coming directly from your speakers, with some sounds like a vocalist seeming to come from the center.

The BSR Spatial Enhancer compares the signal going to each channel thousands of times each second. It then enhances only the elements of separation.

By a distortion free process, it simultaneously amplifies all side sounds. This makes these sounds appear to come from farther to each side.

The middle will sound richer. And as each part of your music diverges from center, it will be drawn more to the sides as well as forward and back, creating a vastly wider and deeper field of sound.

In addition to losing track of where your speakers are located, you will perceive cleaner, more separated sound. It will sound incredibly richer and drama-



tically more distinct, because instruments will be next to each other rather than on top of each other.

There's an LED meter that shows the amount of separation between the channels. The greater the number of LEDs lit, the more the spatial enhancement. There is NO ENHANCEMENT for monaural signals because there are no left and right cues for the Spatial Enhancer to enhance.

HURT FEELINGS

I just received a letter from a very happy customer. Happy letters don't usually depress me, but look at what he said about an earlier model of this unit.

"...during the speaking (monaural) part of the record, the Enhancer's LEDs stayed in the center, i.e., no enhancement. When the record got to the music portion, the enhancer did its thing with the reflective sound and enhanced the 'hell' out of it as it was supposed to."

"What I'm saying Drew, is that this Enhancer is absolutely no phony...it enables one to recreate in your own mind, the real recording situation. It is a very positive addition to any stereo."

This is so remarkable to me that I had to write and tell you about it."

Well, the Enhancer is loved, but I'm hurt that he's so surprised that it does what I said it would do. I spend a great deal of time checking out each device, and if they don't do what I say, send them back, and drop me a line telling me where you think I went wrong!

SIMPLE INSTALLATION

It simply hooks into your tape monitor loop. There are tape in and out jacks and a monitor button so your system's capabilities will remain unchanged.

And, wait till you experience the enhanced sound in your car or with a por-

table stereo. Just a push of the Bypass Button lets you record Enhanced or Non-enhanced sound on your cassettes.

The sound will change dramatically as you rotate the continuously variable enhancement control. It is 8½" wide, 2½" high and 7¼" deep. It's backed by BSR's standard 1 year limited warranty.

TRY PSYCHOACOUSTIC IMAGERY RISK FREE

Try the BSR Spatial Enhancer complete with tape monitor/recording loop in your system. Let distinct instruments come from a broad range of angles.

And, don't forget to take enhanced cassettes with you in your car or with your portables.

Your whole system will seem larger. It really adds an incredible lifelike presence to your stereo system's sound.

If you aren't 100% satisfied, simply return it to DAK in its original box within 30 days for a courteous refund.

To order your BSR Spatial Enhancer risk free with your credit card, call toll free or send your check for DAK's breakthrough introductory price of just \$69 plus \$5 P&H. Order No. 4301. CA res add tax.

Now your own two speakers can sound like a whole concert stage. And if you like the enhancement, please don't be too surprised. If you don't think it does everything I've said and more, make use of DAK's 30 day risk free trial protection.



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GAMES

with the easy-to-use construction option. Alter gravity (how about a drag race on Mars?), add armor, sprinkle a few land mines around, and affix oil-sprayers and even "crushers" to your vehicle to help the destruction along. If you're playing alone, you can soup up the computer's vehicle as well.

THE SOPHISTICATED SLOTH

A couple of years ago, Epyx came out with a series of solitaire build-your-own creature sets. One, *Crush, Crumble, and Chomp!*, subtitled, "The Movie Monster Game," was a great romp, if somewhat limited by then-current technology. Electronic Arts has modified the idea, added a two-player option, and called it *Mail-Order Monsters* (C 64; \$32).

Playing on one of three different levels, gamers can choose from a menu of 12 animals, from humanoids to amoeba-like beings, tyrannosaurus rex, flying pterosaurs, or brontosaurus. Winning battles pays off in victory points, allowing players to beef up their characters with scores of different items, including armor, speed, brains, hit points, natural traits, weapons, and special devices, all of which are lost if the creatures are killed in battle. A do-it-yourself variation on the great strategy arcade game, *Archon*, this one will inspire other designers to improve on the form.

WAR AND PEACE

Strategy and tactics games, aka wargames, traditionally have been more complex than the other genres. The best new additions to this field, *Gulf Strike* (Avalon Hill; Atari, 48K; planned for Apple, 64K; C 64; \$30), *Reforged—1988* (SSI; Apple, 48K; Atari, 48K; \$59), and *The Battle of Chickamauga* (Game Designer's Workshop; Atari, 48K; \$32) continue the tradition. The major improvements lie in the systems for moving units and troops. You can enter data faster and deploy a wider variety of forces, which makes for more realistic battle. Overall the structure is more streamlined. You have fewer interruptions in play, and as a result, a less frustrating, more interesting play experience.

Few changes in the wargame form have occurred in the past year, though two exceptions come to mind: *Field of Fire* (SSI; Atari, 48K; C 64; \$39) and *The Ancient Art of War* (Broderbund; IBM, 128K; \$44). In the former, you command a company of U.S. infantry in a campaign

from North Africa through Europe. Computer players "grow," developing traits based on their combat experiences. When they die, you can replace them with completely new characters. With each unit only six-men strong, action takes place on an unusually human, personal scale.

The Ancient Art of War, of which I've spoken a great deal in the past few issues, is a construction-set war game, the first of its kind. Players can build their own maps and populate them with armies. Refight actual, historic battles or make up your own wars. Available only as a solitaire game, it provides computer opponents of varying degrees of expertise, allowing novices a chance to learn as they play.

And finally, in *Incunabula* (Avalon Hill; IBM, 128K; \$30), you have the ultimate in play potential with a nonaggressive strategy and tactics game. Board game favorites like "Risk," "Monopoly," or "Diplomacy" always guarantee a good time. This simulation combines all three of those types into one superb program for 1–6 human and/or computer gamers. It re-creates the experiences of maturing civilizations in the Fertile Crescent, circa 3000 B.C., and offers the most interesting computer opponents in gaming today. It's a step forward for solitaire games, and a challenge for even the most advanced gamers. *Incunabula* also gives those of us who find the violence in other wargames a turn-off the chance to win a strategy game without ever lifting a sword. One player option lets you develop a utopian, nonviolent society relying on commerce for expansion. It's a tough way to win, but very gratifying if one succeeds.

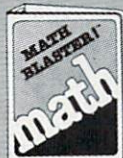
ON THE HORIZON

I've seen some of the new games we can expect on the market in coming months, and they're amazing. Cross-country road races with 3-D graphics of American cities to drive through (*The Great American Cross-Country Road Race*; Activision; Atari, 48K; \$24; C 64; \$29); a strategy/arcade game in which players control a team of robots who are trying to restore order to a giant computer complex (*Countdown to Shutdown*; Activision; C 64; \$29); a joystick-controlled simulation of air traffic control (*Kennedy Approach*; Microprose; C 64; \$34); sequels to *Wizardry* and *Ultima*, and much, much more. The excitement continues, and we'll be here to tell you about it. **FC**

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WORD ATTACK lets students ten through adult discover the meanings and usages of 675 new words. Includes a fun, fast-action arcade game and add-your-own-words editor. Apple™, IBM™, Commodore 64/128™, Atari™. 49.95.



SPELL IT teaches ten year olds and older how to spell a thousand and one of our most commonly misspelled words. Vivid graphics, animation, sound effects, a lively arcade game and add-your-own-words editor, too! Apple™, IBM™, Commodore 64/128™, Atari™. 49.95.



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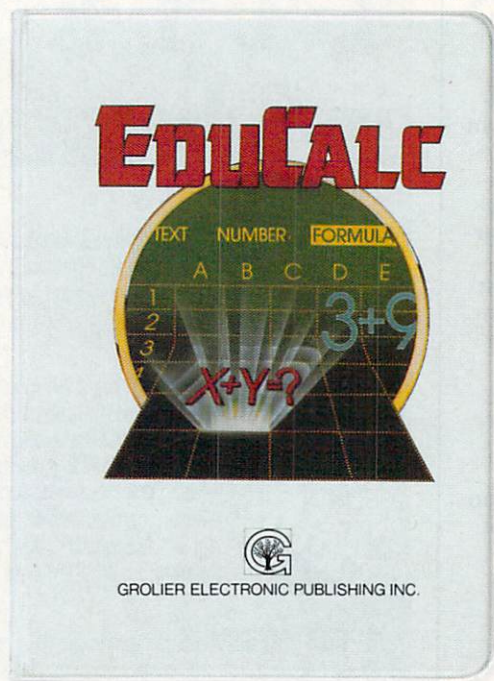
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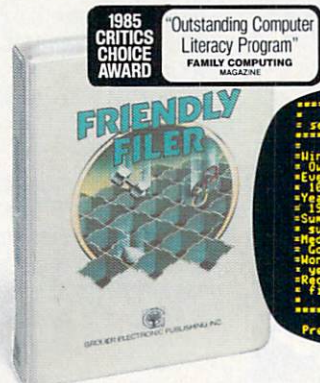
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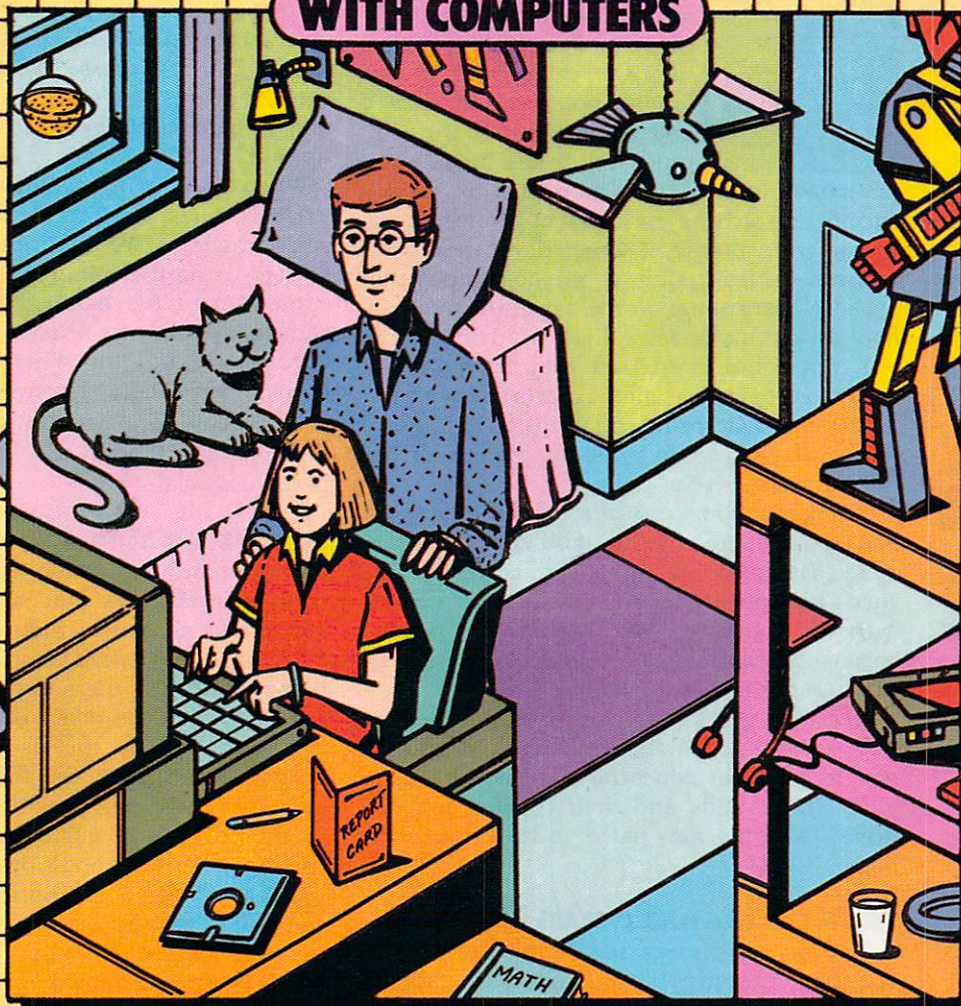
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A PARENT'S GUIDE TO

LEARNING *at* **H**OME

WITH COMPUTERS



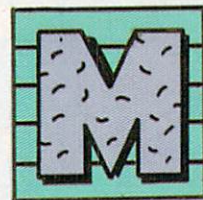
When it comes to learning, the computer packs a powerful punch. The computer is a gentle tutor, a firm, but friendly companion that can cajole kids of all ages and interests to master new skills and venture into creative explorations.

But the computer can't do it alone. For maximum effect, parents must take an active role. To guide them in this challenge, we've compiled this special report, complete with buyer's and user's tips, a selection of the best educational software, advice from teachers, and more. We hope this information will better equip families to make the most of the computer as a learning tool.

EDUCATIONAL COMPUTING COMES HOME

READ ON TO FIND OUT
HOW TO USE THE COMPUTER
TO ENHANCE LEARNING.

BY SALLY REED



Michael Bernstein was not always a morning person. How many 12-year-olds are? Now he's the early riser in the family, popping out of bed and perching before the computer well before breakfast.

Michael devotes some mornings to his science-fiction writing, or to one of his own fantasy games in progress. Other days, he creates original tunes using a music-composition package. Depending on the day of the week, he may review his spelling lists, studying words he's not yet mastered as they flash on the screen. He polishes school reports using a word processor. Last spring, he spent several morning hours putting the finishing touches on his Bar Mitzvah speech.

"Michael's whole attitude toward homework has changed," reports his mother, Carol Bernstein. "He's more willing to do it, correct it, and check his spelling because it's all much easier with the computer. His teachers are pleased because his work is more legible and his homework grades have actually improved."

Like kids across the country, from elementary to high school age, Michael has learned how to make the educational most of his computer. These kids and their families are pioneers, following new paths to learning in the home.

TODAY'S TRAILBLAZERS

Like any trailblazers, the Bernsteins have encountered obstacles. Confusing, misleading information; an absence of coherent studies that point to the one or two most obvious benefits of learning at home with the computer; and uncertainty about their own combined roles as parents and teachers: these are just a few of the roadblocks that make computer-age parenting tough. But with perseverance and a little guidance from people who know, parents have been able to make good educational use of the computer. Whether it's making noticeable improvement in writing and spelling, plunging into new worlds, exploring science, solving problems and puzzles, fiddling with circuits and logic gates, exploring new, creative horizons, gaining confidence in school, growing used to the computer as an invaluable, productive tool, or a combination of all the above, kids of all ages have found the machine to be an invaluable educational companion.

Darcy Rooney, for example, an 8-year-old from Richton Park, Illinois, dramatically improved her spelling scores on school tests with a workout on the family's computer.

An excellent student in all other subjects, Darcy had trouble with her spelling. "We tried everything her teacher and I could think of to help, but nothing worked," says her mother Bobbie Rooney.

Last summer, Rooney took the spelling words from Darcy's textbook and wrote them into a practice program on the computer. Darcy practiced her spelling almost daily that summer and often remarked on how much easier the computer made the process. "The effort was a super success," Rooney says. Darcy's spelling scores that used to hover between 60 and 80 percent at her grade's lowest level, shot up to 85 to 100 percent at advanced levels.

When Brian White was having problems with English and writing, Yarka White turned to her son's teachers. "We discovered that once Brian started using the computer, he wasn't as concerned about his handwriting and his ideas came more easily," she says. "It's easier for him to correct his spelling. When he uses a computer, he's much more creative and coherent."

Brian now composes 25-page papers for his honors English class and long reports for his psychology class.

THE RISING TIDE

Microcomputers made their debut in the schools seven years ago. Since then, about 90 percent of all school districts have acquired them—about 700,000 computers in all. On the home front, computers were slower to start appearing, but have taken off considerably—fueled not only by the use of computers in schools, but through the popularity of computer games, and the growth of work at home. With more than 12 million computers in America's households, and, by some counts, as many as 40 percent of households purchasing computers with education in mind, clearly an educational tide is swelling.

One survey conducted by the National School Board Association, found that parents purchased computers to provide their kids with a headstart on courses at school. Sixty percent of FAMILY COMPUTING's own readership use educational software packages.

Concrete evidence of direct test-score improvement as a result of computer use is conspicuously absent. However, educational expert after expert, teacher after teacher, and parent after parent attests to the educational value of the computer at home.

"Technology makes the home a more effective learning environment," says Frank Withrow, director of the Division of Technology, U.S. Department of Education. "There is the beginning of what I call the breaking down of walls between home and school. As we get more technology in the home and schools, we'll have a better partnership between them."

**"AS WE GET
MORE TECH-
NOLOGY IN THE
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BETWEEN THEM."**

SALLY REED, a Chicago-based writer and editor specializing in education and technology, has contributed to The New York Times, Better Homes and Gardens, and Ms. Her last special report, on "PreSchool Computing" appeared in FAMILY COMPUTING in November 1983.

"When kids get familiar with the computer at home, they're ready to take on whatever we give them at school," reports Barbara Bayha, an elementary school teacher and computer curriculum specialist in the Cupertino Union School district, in California.

Using a computer at home, especially for such tasks as word-processing and data-base management, leads junior and senior high-school kids to more specialized, advanced work at school, according to David Moursund, founder and director of International Council for Computers in Education, a research and information exchange group, located in Eugene, Oregon. By getting used to new applications in the nonthreatening atmosphere of their living rooms, kids can take advantage of more sophisticated training available to them at school with specially trained instructors, says Moursund.

MAKING IT WORK

To surmount the stumbling blocks, parents have to know what to look for and what to avoid, what the computer is capable of and what its limitations are. That's not easy. Hot issues abound in the field of educational computing—debates over the value of learning to program, mostly in BASIC; controversies over how best to harness the computer's interactive potential; the effectiveness of drill-and-practice; the advisable amount of time kids should spend on the computer. At times, it can seem as though everyone's got a theory and an axe to grind, and with the educational credentials flying right and left, it's easy for a parent to feel confused.

Use of the computer at home differs considerably from use of the computer at school. For one thing, what may pass for play at school, a session with a math-practice package, for instance, just won't work as well when it has to compete with TV, the outdoors, entertaining computer games, and more.

Also, with 20, 30, or even 40 students to satisfy, inspire, and stimulate, teachers regard each of their pupils differently than a parent does when dealing with a child with a reading problem.



1. Be a learning partner.

Spend plenty of time helping your children get acquainted with your computer hardware and each piece of software you purchase.

2. Establish guidelines for use and care of the computer.

Teach your children how to care properly for hardware and software. (For example, no food and drinks near the computer work station, etc.) Establish a schedule for use of the computer to ensure equal time for everyone in the family. At the same time, urge cooperative learning and recreation among family members.

3. Create specific learning goals for each child.

Every child has unique strengths and weaknesses. Consult your children's teachers, and your children as well, to find out what areas you should target for improvement. Then select software designed to tackle those areas. Track each child's progress over the year, reevaluating the learning plan at least twice a year. Once your child builds confidence, advance to programs with more challenges and sophistication.

4. Coordinate your at-home learning plan with the school's plan.

Find out which software packages your children use in class. Speak to their instructors and find out whether it's appropriate to use the same software at home or to supplement it with other packages. Work with parent-teacher organizations to sponsor lectures and demonstrations of software applications, with time for attendees to exchange learning strategies.

5. Select software carefully.

Be sure to choose software that will be easy for your child to use. Software instructions should be geared to the reading level of the child who will be using the program.

6. Establish limits on game

play. You should establish a cooperative policy that balances learning with recreation. One solution: Make game playing a bonus that comes at the end of established learning periods. It can serve as a powerful incentive. At the same time, remember that many adventure games can help develop logic and decision-making skills. (See "How to Make Learning Fun," in the September 1984 issue, page 30.)

7. Form learning groups with other parents and children.

Share your educational strategies and set up a software exchange program. Set up group projects so your children can interact with others. Contact your local PTA or library to find out if groups already exist, or start your own.

8. Don't be heavy-handed in enforcing computer work.

There's nothing worse than forcing the computer on your child. If your children lose interest in the computer for prolonged periods, find out where the problem originates. The software may be too difficult, or, perhaps, it's not challenging enough. Most of all, remember that if you try to make computing at home simply an extension of schoolwork, your child can become overloaded. Make sure computing is fun.

9. Use the computer for your own learning explorations.

Your computer is not only an educational tool for your children, but for you as well. Perhaps you'd like to tackle a foreign language—check out the software available in that area; or maybe you'd like to take a college course from your home via modem. There are quite a few "electronic colleges" operating throughout the country. Most of all, remember, the computer is a permanent part of your family, and everyone in the family can benefit when it's used effectively.

Glossary of Educational Terms

To maximize your computer's educational potential you have to be able to make sense of the terms used by teachers and software publishers. Here are a few that pop up most frequently.

BASIC: An acronym for Beginner's All-Purpose Symbolic Instruction Code; a simple and widely used programming language, the one most often taught in schools.

Cognitive skills: Referring to thought processes, the ability to identify and dis-

tinguish images, shapes, and facts, and to understand relations between ideas and objects. Often cited as a benefit of software for preschoolers.

Computer Aided Instruction (CAI) or Computer Assisted Learning (CAL): Computer-based methods of instruction that rely on software—commercially packaged or devised by a teacher—to guide students step by step to the mastery of a skill or concept. Electronic flashcards and workbooks are the principal tools of CAI.

Computer Literacy: The ability to use a computer and the basic understand-

ing of its operations and applications; may include discussion of computer history and ethical issues such as piracy.

Courseware: Software used in CAI or CAL.

Curriculum-based: Geared or pertaining to subjects taught in school.

Drill-and-Practice: An electronic flash-card teaching method, used in educational software, that repeatedly quizzes the student until information is mastered.

Edutainment: A category of educational software featuring a heavy entertainment component.

Logic Skills: The aware-

ness of cause and effect relationships; the ability to deduce facts from a given set of circumstances, and order events in time sequence. The stated benefit of many educational programs for preschoolers and young children.

Logo: A commonly used programming language developed by Seymour Papert that focuses on graphics and directionality; valued by parents and teachers as a multifaceted, powerful, yet friendly invitation to programming and creativity, and believed by many to teach logical thinking.

Pedagogically sound: An

expression used to describe instructional material that follows established, tried-and-true teaching methods.

Problem-solving: The skill used to arrive at plausible answers from a group of situations or facts provided; often one of the benefits found in adventure games and other open-ended educational packages.

Simulations: An activity—in this case, software—that recreates physical environments, with parameters that the user may adjust and interact with to see how actions affect different variables.

BUYER'S PRIMER

A SHORT COURSE ON BUYING SOFTWARE

WHERE TO SHOP

You'll find educational software in a variety of places including local computer stores, national chains, and department stores. The best ones will let you test the package before you buy it. Selection varies from shop to shop, so you'll probably have to do some footwork before you find the store that best suits your needs. Most packages are priced between \$29 and \$59. Some, however, such as SAT-preparation packages, can run as much as several hundred dollars. Watch for special offers.

Mail order is another option, but there's some risk here due to the volatility of the market and the instability of smaller companies. Check the company's track record before you put your check in the mail. See "Bulletin Board" for a list of software catalogs.

WHAT TO KNOW

Do some preliminary research before you dip into your pocketbook. Read software reviews published in computer magazines, users' group newsletters, and other reputable publications.

Read the software package or call the manufacturer to find out warranty information: the period in which defective disks can be replaced, the policy for user damage (such as ruining a disk by spilling a drink on it), and the price for backup copies. Manufacturers' policies vary, with some more flexible than others. For example, Springboard Software has a "satisfaction guaranteed policy" that allows users to return software within 30 days if it doesn't meet their expectations.

WHAT TO BUY

Your software choices will be limited by the brand of computer you own. According to TESS (The Educational Software Selector), about 70 percent of educational software on the market is for Apple computers, with Commodore and IBM following. Your local software dealer should be up-to-date on what's available for your machine.

Much of this year's educational software follows a drill-and-practice format. However, quite a few manufacturers are designing unusual tutorials, games, and simulations specifically for home use.

WHAT TO ASK

Don't be afraid to ask questions when you're purchasing software. Here's a list to get you started:

- What is the software supposed to do? Does it teach reading? Language arts? Math? Science concepts?
- What techniques does the software use? Drill-and-practice? Tutorial? (Ask yourself what method is best for your child).
- What age and reading level is the program aimed at? (Does it match your child's level?)
- How difficult is the program to use?
- Does the program contain "user-friendly," comprehensive documentation that will help you figure out how best to apply the package? (For example, does it include a list of vocabulary? Suggestions for use? Supplementary activities?)
- Does the program balance fun and learning?
- Does the software include features to let you customize the program? For instance, can you change your child's vocabulary lists on a weekly basis to really enhance the package's value?

There's also the matter of training and time. Teachers expect to spend a great deal of time learning and thinking about how to use the technology—that's on top of the special degrees and training they have as teachers. Parents, naturally, are less familiar with teaching methods, too. They have fewer hours to devote to crafting lessons and developing educational programs.

On the other hand, parents have the advantage of intimacy: a personal relationship with their kids, and an intimate knowledge of their personal needs. Still, without the teaching background and familiarity with methods, they have their work cut out for them.

SELECTING SOFTWARE

Perhaps number one on parents' lists of concerns is how to make sense of the 8,000 educational software titles on the market. (Refer to the accompanying "Buyer's Primer" and "Tips for Parents" for hints on this process.)

You can program your computer, as Bobbie Rooney did, to help your child practice math or spelling. But most parents prefer to look for software geared to a specific skill, because, as Carol Bernstein says, "It takes so long just to set up a program that it isn't worth it for some assignments."

Parents who go the route of commercially available educational software have a mind-boggling array of subjects and teaching methods to choose from. (For specific titles see "Critics' Choices" and "Teachers' Choices" software recommendations on pages 36 & 37. For a glossary of terms, see accompanying box.)

Not all the "educational" software out there deserves that label. And not all that deserve it belong in the home. Some packages fall seriously short in the learning department. Others are too dry for sustained home use.

Some packages follow a straightforward approach, known as drill-and-practice, that rehearses kids in basic facts, such as spelling and math tables. Says Larry Vaughan, the manager of Northeast Regional Exchange, a seven-state educational technology information service, "Drill-and-practice isn't necessarily fun, but it does work. Kids have to learn the basics, and the computer helps them do it efficiently." Drill-and-practice software sometimes includes a game element, intended to spice up the proceedings and encourage further use.

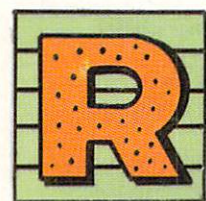
Some software is more open-ended, encouraging kids to explore freely. Simulations, for instance, recreate a variety of worlds. (See *Home-School Connection*, March FAMILY COMPUTING.) Barbara Bayah values the way simulations give students the "chance to make decisions and choices and try a lot of possibilities in a safe environment."

The indisputable leader of educational applications, teachers and parents agree, is word-processing. As the Bernstein and White families have found, a word processor is a warm and friendly invitation to explore and create.

Says Northeast Regional Exchange's Vaughan, also the father of four, "I want to let my children be in control of their environment. I teach them to use data-base management and word-processing programs because that's what they'll be using one day."

Other productivity packages are appearing which simplify and introduce the basics of computer applications. Easy-to-use data-base managers familiarize kids with the benefits of information management. And telecommunication packages can hook up kids to vast networks of information, ranging from news retrieval services to electronic encyclopedias. (See this month's *Telecomputing*, page 14).

The list of applications goes on. Programming languages—BASIC and Logo being among the best known—give kids the chance to instruct the computer to follow a logical series of commands. Many educators believe that, by working out their own programs to create graphics or sounds or other effects, students hone their reasoning abilities, and learn a potentially valuable skill for adult life, as well. (See the six-part series on Logo starting in the September 1984 FAMILY COMPUTING.)



Regardless of the software's quality, it can't make magic without parents' involvement. Taking the time and making the effort to learn and research the areas that children might need to improve does pay off.

W. Patrick Dickson, associate professor of Child and Family Studies at the University of Wisconsin, has followed the fluctuations in the use of the personal computer over the past several years.

"The moral is the same as always," he says. "When you come right down to it, the computer is only as helpful as the parent working with the child. Parents have to put a lot of effort into using the computer effectively. It's not like a television. Kids can't just plunk down in front of it. It requires supervision, cajoling, encouragement, preparation."

As the many articles in this issue attest, there's a lot of territory to cover. But with the right kind of pioneering, persevering attitude, you should reap the rewards of educational computing at home.

Alfred Bork, director of the Educational Technology Center at the University of California, at Irvine, studied how families interact when using computers located in public libraries. He had some interesting observations:

"It was clear that a joint learning activity was going on," he recalls. "All involved were learning something, and part of this learning was coming through the interaction of family members with each other, stimulated and motivated by the interaction with the computer. An unexpected form of family togetherness."

BULLETIN BOARD

HOW TO FIND INFORMATION

If you have no idea how to get started, where to look, or who to turn to on your quest for educational software and related information, here are some resources to help you out. Of course, there are probably quite a few others in your own neighborhood in the form of users' groups, libraries, YMCAs, and community colleges. While none of these groups will be able to answer all of your questions, at least they can point you in the right direction.

BOOKS

Check for the following books at your local library or the computer or education department of your local bookstore.

Bank Street's Family Computer Book, by Barbara Brenner with Mari Endreweit (Ballantine), \$6.95

Computers and Your Child, by Ray Hammond (Ticknor and Fields), \$7.95

Growing Up with Computers: A Parent's Survival Guide, by Frederick and Victoria Williams (William Morrow), \$15.95

A Guide to Computer-Age Parenting, by Peter Scharf (McGraw-Hill Book Co.), \$9.95

Kids and Computers: The Parent's Microcomputer Handbook, by Eugene Galanter (Putnam), \$7.95

Learning with Computers, by Alfred Bork (Digital Press), \$28

Microcomputers in Education: A Handbook of Resources, edited by Katherine Clay (Oryx Press), \$22.50

Mindstorms: Children, Computers & Powerful Ideas, by Seymour Papert (Basic), \$6.95

My Students Use Computers: Learning Activities for Computer Literacy, by Beverly Hunter (Reston/Prentice-Hall), \$17.95

Parents' Guide to Accredited Camps (\$8.95). Available from the American Camping Assoc., 100 Bradford Woods, Martinsville, IN; or call (800) 428-CAMP

Parents, Kids, and Computers: Learning Adventures Beyond the Classroom, by Lynne Alper and Meg Holmberg (Sybex Books), \$3.95

ELECTRONIC INFORMATION CLEARINGHOUSES

Anyone with a computer, modem, communications software, and a telephone can obtain information through the data bases listed below.

ADCIS-NET, part of CompuServe ([800] 848-8990) is available to members of the information network and to members of the Assoc. for the De-

velopment of Computer-based Instructional Systems. ([614] 422-6192). As the name implies, the data base provides information on computer-based instruction.

EPIE ON-LINE, accessible on CompuServe, provides an electronic version of The Educational Software Selector (TESS), with information on the availability and function of educational software. For more information, contact EPIE, P.O. Box 839, Water Mill, NY 11976.

RICE (Resources in Computer Education), provides information on educational applications. Developed by the MicroSIFT Project of the Northwest Regional Educational Laboratory, 300 S.W. Sixth Ave., Portland, OR 97204; (503) 248-6800. Also available online from BRS Information Technologies, 1290 Ave. of the Americas, Suite 1200, New York, NY 10104; (212) 333-7660.

ORGANIZATIONS

Educational Products Information Exchange (EPIE), P.O. Box 839, Water Mill, NY 11976. The country's only educational consumer agency providing schools and parents with independent evaluations of computer software.

International Council for Computers in Education, Department of Computer and Information Science, University of Oregon, 1787 Agate St., Eugene, OR 97403. (You can also contact the Council via CompuServe #70014.2117). A professional organization for computer educators that sponsors workshops and publications including *Parent's Guide to Computers in Education*, by David Moursund (\$3.50).

Minnesota Educational Computing Corp. (MECC), 3490 Lexington Ave., St. Paul, MN 55112. Provides training programs, newsletters, a help line, free *Home Software Library* brochure and *Educational Computing Catalogue*.

Northeast Regional Exchange, Inc. (NEREX), 34 Littleton Road, Chelmsford, MA 01824. A service center for seven states, NEREX is nationally recognized for its publications, conferences, and computer training sessions. The following booklets are particularly useful: *Microcomputers in Education: An Introduction* (\$3), and *Computer Literacy: An Introduction* (\$3).

Technical Education Research Centers (TERC), 1696 Massachusetts Ave., Cambridge, MA 02138. A non-profit research and development organization that sponsors a Technology Center with the primary focus on microcomputer applications in science and math.

TALK to the TEACHERS

Suppose you could pull together your very own panel of educational computing experts, what would you ask them?

We talked to teachers from across the country, specialists on the use of computers in various subjects in school. We found out what questions parents asked most often and how teachers responded to those questions. The most helpful answers are printed here.

Parents' concerns fall into two categories: Computer use at home and computer use at school. In the course of these interviews, all teachers agreed: The computer has created a unique opportunity. Teachers, parents, and children, combining forces, can work together to improve the quality of our children's education at home and in school.

What computer should I buy?

Beth Lazerick: That depends on how much money you want to spend and how you plan to use the machine. Determining your budget helps limit your choices. If you plan to use your computer for instructional purposes, you need one that works with a wide range of educational software. If you plan to use it for business applications, you need a computer that can handle the job. Knowing how you plan to use your computer also helps determine the amount of equipment you need to buy. If you plan to use the machine



Barbara Devir:

IF PARENTS WANT THEIR KIDS TO LEARN FROM A COMPUTER, THEY MUST DEVOTE TIME AND ENERGY TO WORKING WITH THEM.

ANSWERS TO THE COMPUTER-RELATED QUESTIONS PARENTS MOST OFTEN ASK THEIR CHILDREN'S TEACHERS

BY LESLI ROTENBERG

for word-processing, you definitely need a printer.

Ann Dana: If you want your children to be able to use the same software they use at school, you should buy the kind of computer most commonly used there.

David Fiday: Several parents lined up to talk to me at a recent school-sponsored computer show. "Do you all want to know which computer to buy?" I asked. Of course they did. I said I needed to know *why* they wanted a computer before I could help them choose one. "But don't our children need a computer at home?" they asked.

Do my children need a computer at home?

Barbara Devir: TV ads portray computers as magic machines that make kids better students. Parents who buy computers in response to media hype usually end up disappointed. I discourage parents from buying a computer unless they plan to use it with their children. If parents want their kids to learn from a computer, they must devote time and energy to working with them.

Beth Lazerick: That question is like "Do kids need a car when they reach driving age?" In most cases, the answer is No. A car makes getting around easier for some teenagers. But they don't need one to get to school. Your kids don't need a computer. But it can make learning easier for some children.

LESLEI ROTENBERG is assoc. editor at Teaching and Computers magazine.

Laura Rosenzweig: I don't think a computer is necessary for academic success. We teach children how to use computers as tools. Parents shouldn't buy computers for their child's education unless the child displays a genuine interest in them. Some parents buy them without consulting their kids. Then they resent the kids for not using them. The bottom line is that some children take to computers and others don't.

David Fiday: Buy a computer if you're willing to get involved with your child's education. The most successful applications of educational computing at home occur when parents and kids work together.

Can a computer help my child learn?

Nancy Kovatch: Not by itself. Most kids need an adult to give them direction.

David Fiday: We haven't done any formal studies, but I'm convinced that kids benefit from using computers. They motivate students to learn. They help individualize instruction. In large classes, computer instruction lets kids get the personalized attention and immediate feedback they deserve.

Tom Lough: Like a book, a computer can be used effectively or ineffectively. If used appropriately, a computer can help a child learn.

Angela Anthony: Yes. If used with the appropriate software, computers can open up new ways of thinking.



David Fiday:

THE MOST SUCCESSFUL EDUCATIONAL APPLICATIONS AT HOME OCCUR WHEN PARENTS AND KIDS WORK TOGETHER.

**Craig
Dickinson:**



IF YOU HAVE A WORD-PROCESSING PROGRAM, ENCOURAGE KIDS TO KEEP A JOURNAL.

What software should I buy for my child?

(For specific teacher's recommendations, see the accompanying Teachers' Choices.)

Barbara Devir: That depends on the child. If she's interested in writing, get a program that lets her write stories and illustrate them on screen. If he's having trouble with multiplication facts, get a program that drills him in math.

In general, for home use I recommend programs that develop thinking skills but take a long time to use. That's because, in school we just don't have enough time to use this type of software. I almost never recommend the programs we use in class, because I don't want kids to get bored with them. In school, software is linked to the curriculum. At home I believe computer use should be more entertaining.

Beth Lazerick: Look for open-ended programs that have a long shelf life. I recommend problem-solving software and adventure games.

A word-processing program sometimes helps children who are unsuccessful with traditional writing instruction—students who have difficulty manipulating writing instruments, for example, or ones who have trouble organizing their ideas on paper.

Ann Dana: You can't go wrong with a word-processing program. A child can use word-processing software in every grade for every subject area. Beyond word-processing, look for programs that are fun to use at home.

Laura Rosenzweig: That depends on what you want the software to do for your child. If you want your child to word-process at home, buy the program, if there is one, being used at school.

Nancy Kovatch: Come into school and try the software we have. There's no substitute for hands-on experi-

MEET THE TEACHERS

Angela Anthony: Director and instructor of computer courses for students K-8 at Saint Helen's School in Schenectady, New York. The Apple Computer Club National Merit Competition named her best club adviser in 1985.

Ann Dana: A microcomputer consultant and computer teacher (grades K-8) for District 181 in Hinsdale, Illinois. She is an adjunct faculty member in the Computer Education department at National College of Education, Evanston.

Barbara Devir: Fourth grade teacher at Woodside School, Peekskill, New York. An independent computer consultant, she also conducts individual and group training sessions.

Craig Dickinson: Computer coordinator at Asa C. Adams Elementary School, Orono, Maine. He teaches math and computer literacy to grades 2-6 and coordinates the school's gifted and talented program.

David Fiday: Media Director for Palos East School in Palos Park, Illinois. He coordinates the library's media services, and consults on computers for students in grades K-6 and teachers.

Nancy Kovatch: Math/computer science coordinator for grades K-12 at Saint Anne's Belfield School, Charlottesville, Virginia.

Beth Lazerick: Computer Education Director for grades preschool-12 at The Dalton School, New York.

Tom Lough: Assistant Professor of physics, algebra, and computers at Piedmont Virginia Community College, Charlottesville, Virginia. He edits the *National Logo Exchange*, a newsletter for Logo users.

Laura Rosenzweig: Computer coordinator for grades 7-12 at Brentwood School, Los Angeles, California.

ence when it comes to choosing software. Your child can help you find the most appropriate packages.

Can I borrow the school's software for use at home?

Ann Dana: We don't lend school-owned software for several reasons. First, commercial software is often leased or sold with an agreement that prohibits copying. The school's responsible if someone copies its software. In addition, some software is designed so that attempting to copy it damages or destroys it.

We do let teachers lend out home-made programs and public domain software.

**Ann
Dana:**



LOOK FOR PROGRAMS THAT ARE FUN TO USE AT HOME.

Why isn't my child spending more time on the computer at school?

Craig Dickinson: It's impossible to schedule all the students in school for equal time on the limited number of computers we have. We try to balance the curriculum so that all students get some exposure.

Laura Rosenzweig: Most parents who ask this question have been brainwashed into thinking that computers provide children with tickets to success in tomorrow's job world. I try to play fireman, putting out the fires caused by the hype.

Ann Dana: The problem may be the teacher. Some feel uncomfortable with computers. If you think that this may be the case, talk to him or her about it. Perhaps the teacher could use more training. Remember, teachers are usually expected to cover a great deal of material in a limited amount of time—with insufficient materials and equipment.

My child knows more about computers than I do. How can I continue to help him or her learn more?

Barbara Devir: Shop around for a challenging after-school or summer computer program. Before you choose one, look at the ratio of kids to computers. Make sure there's at least one computer for every three children. Also, investigate the curriculum. The best curriculum covers a wide variety of applications. If your child is advanced, find a class that teaches some programming skills. Finally, before signing up, get to know the instructor and talk to parents whose children have taken the class.

Tom Lough: Ask your child to help you learn about computers. Teaching helps kids learn more. It also provides an opportunity for you and your child to communicate.

Can you suggest computer activities for my child at home?

Craig Dickinson: If you have a word-processing program, encourage

TEACHERS' CHOICES



Angela Anthony:

COMPUTERS CAN
OPEN UP NEW WAYS
OF THINKING.

children to keep a journal or write letters to friends and relatives. If you have a data-base program, show kids how it can help them keep track of their baseball card or coin collections.

David Fiday: Try typing in programs listed in magazines and books.

Our computer is gathering dust at home. How can I encourage my child to use it?

Tom Lough: Spend time working together on the computer. Try learning programming with your child. Invest in software you can use together.

Barbara Devir: Find software that interests your child. Find a library that lends programs (or a store that lets you try out packages on the premises), and try a variety of programs. Eventually, one program will strike the right chord.


Many libraries offer programming books for beginning computer users. Look for books that contain simple, type-in programs. For example, I recommend a book of programs from Scholastic called *Basic Fun*. (Also, try books from Osborne/McGraw-Hill and Datamost, among others.)

Nancy Kovatch: Invest in a word-processing program. It gets kids excited about computers by making writing easier for them.

Where can I learn more about computers?

Angela Anthony: Volunteer to help out in the school's computer lab. At my school, I train parent volunteers to use Logo. Then they help me supervise the kids in the computer lab. We all benefit from the experience.

David Fiday: Look for a computer fair in your area. At our local fair, parents share experiences and swap public-domain programs.

Nancy Kovatch: Find a computer course for parents, one that works on the same kind of projects that kids do in computer class. You'll really enjoy learning what the kids know about computers. It will help you share your children's enthusiasm. 

BY SUZETTE HARVEY

"What software would you recommend that parents buy for their kids?" was the question we asked teachers nationwide.

The question's a tough one. The answer depends on the student, many teachers told us. That's why, for the most part, teachers recommend programs for home use that are open ended and versatile—tools that can be used as students see fit, and don't fall into any clear-cut categories. Parents seeking software for specific skill-building should consult their kids' teachers to assess individual needs.

The programs recommended below, and the accompanying comments, are the opinions of approximately 25 teachers responding to our questionnaire. For a more complete list of software, refer to the accompanying "Critics' Choices."

WORD PROCESSORS

Bank Street Writer. Home version available from Broderbund. For Apple, 64K; Atari, 48K; C 64; IBM PC/PCjr, \$49.95–\$79.95. Menu-driven, junior-level word processor. "Easy to use" . . . "Does a lot for the self-esteem of students who usually get low grades because their papers are sloppy" . . . "Our high-school students spend more time editing. They're proud of their results."

Homeword. Available from Sierra, for Apple, 48K; Atari, 48K; C 64; IBM PC/PCjr, 64K. \$49.95–\$69.95. Icon-driven, junior-level word processor. "Easy to learn and use and can be streamlined for more advanced users."

SuperSCRIPIT. Available from Radio Shack, for TRS-80 Models III/4, 48K. \$199. Full-featured word-processor. "Word-processing is the single best application for home computer use."

INTEGRATED SOFTWARE

AppleWorks. Available from Apple Computer Co., for Apple IIe/IIc, 64K, 128K (recommended) \$250. Word-processor, data base, and spreadsheet integrated in one package. "Even seventh graders can operate it" . . . "The type of software kids will eventually be using as adults."

ENTERTAINING EDUCATION

Kids on Keys. Available from Spinnaker for Apple, 48K; Atari, 32K; C 64; IBM PC/PCjr, 64K. \$20.95–\$29.95. Introduction to computer with many activities focusing on word and letter recognition, for ages 4–9. "Excellent graphics. Teaches keyboarding skills with very good technique. Kids love it."

Tic-Tac-Show. Available from Advanced Ideas for Apple, 48K (disk); C 64; IBM PC/PCjr, 128K. \$34.95–\$39.95. Word exercises in a game show format; the program lets you add your own lists of words. "Highly motivating for students; has an

easy authoring system. We've had Home Economics, Math, and Social Studies teachers write their own sets of questions."

Early Games for Young Children.

Available from Springboard Software for Apple, 48K; Atari, 16K (cass.), 48K (disk); C 64 (disk); IBM PC/PCjr, 64K. \$34.95. Multiactivity package for prereaders and premath students. "Includes many different games, some of which can be played by 3-year-olds" . . . "Fun, educational, with good sound effects. A small child can learn to recognize numbers and letters by using this program."

UNUSUAL APPLICATIONS

Microzine. Available from Scholastic for Apple, 48K. \$39.95. Computer learning library includes games and learning activities; introduces computer literacy. "Comes out every other month. Each new edition provides variety and new material for middle-school-age kids" . . . "Good for all ages, 8 to high teens."

The Newsroom. Available from Springboard for Apple, 64K. Planned for IBM PC/PCjr, 128K. \$49.95. Newspaper publishing package combines graphics and word-processing. "Limited only by your imagination. Fosters writing. A wonderful program!"

Mousepaint. Available from Apple Computer Co., for Apple, 64K; Macintosh, 128K. \$99–\$149. Graphics program gives you control over color and shape-making possibilities. "Encourages children to be creative, to use the computer while creating something uniquely their own."

PROGRAMMING

Logo. Available from Krell for Apple, 64K. \$89.95. One of the most popular versions of a very popular programming language. "An active involvement for children; a tool for them to use creatively. Not simply a game. At a higher level, Logo is a (serious) programming language with features important in many types of computer-problem solutions."

PROBLEM-SOLVING

Robot Odyssey. Available from The Learning Company for Apple, 64K. \$49.95. Kids must escape from an underground world by constructing and instructing powerful robots. "Kids can explore, and learn how to put together robots and circuits in a very open-ended package. Kids go up to their rooms and aren't seen for ages."

Zork. Available from Infocom for Apple, 48K/Macintosh; Atari, 32K; IBM PC/PCjr, 48K. From Commodore for C 64. From Radio Shack for TRS 80, Models I/III. \$39.95–\$44.95. Popular text adventure lets you explore a fantastic underground world. "A good game program that encourages reading and the use of logic."

C CRITICS' C CHOICES

BEST OF THE BEST EDUCATIONAL SOFTWARE

Of the hundreds of educational titles that appear yearly, which ones withstand the test of time? Which ones best fulfill the objectives stated on the packaging? We went back to our team of family reviewers and asked them to re-evaluate the software they'd originally rated with four stars in the category of overall performance in reviews appearing through July, 1985. They found a healthy batch of educational programs that we can recommend, no holds barred, as top-rate selections for families seeking to exploit their computer's educational possibilities. Take a look at this roster of winning titles: You'll find a wide range of stimulating programs, all terrific learning opportunities covering a broad spectrum of subjects.

CREATIVITY



Bank Street Music Writer, from Mindscape (800) 221-9884. For Atari, 48K; C 64. Planned for Apple II series, 48K (\$49). Enter music in three parts; edit and play back with versatile music processor. Print out and even check compositions for time-signature accuracy. Good for musicians and nonmusicians alike.

Blazing Paddles, from Baudville (616) 957-3036. For Apple II series, 48K (\$49); C 64 (\$34) w/mouse, joystick, or graphics tablet. Computerized paint program lets kids as young as 6 years old create pictures, alter the design pixel by pixel, add text in a variety of fonts, and use preprogrammed shapes.

Dazzle Draw, from Broderbund Software (415) 479-1170. For Apple II series, 128K w/mouse, joystick, or graphics tablet (\$59). Powerful paint program lets 9-year-olds to adults create stunning drawings and posters for storage on disk or printout.

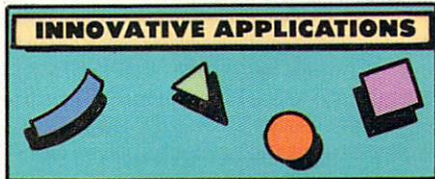
Music Shop, from Broderbund. For C 64 (\$44). Write, edit, print, and

play music. Fun, versatile tool lets you enter your piano lessons, for instance. Use joystick, keyboard, or combination of both to enter notes, change voices, and more.

Paint, from Atari (408) 745-2820. For Atari, 48K (\$49). Rich graphics package exploits Atari's brilliant color capacities with variety of options. Package includes well-written, comprehensive guide book.

Songwriter, from the Scarborough System (914) 332-4545. For Apple II series, 48K; Atari, 48K; C 64; IBM PC/PCjr, 64K (\$39). Musicians and nonmusicians ages 5 and older play with notes, creating melodies and compositions and learning music basics in simple music-making package that simulates player piano.

INNOVATIVE APPLICATIONS



Friendly Filer, from Grolier Electronic Publishing (800) 858-8858. For Apple II series, 64K; C 64; IBM PC/PCjr 128K (\$39). Tutorial module accompanies this junior data-base management system, one of the fundamental computer applications.

Microzine, from Scholastic Software (212) 505-3000. For Apple II series, 48K (\$39). Computer learning library; each edition usually includes interactive adventure story and special introductory application such as data-base management or graphics, plus other activities.

The Print Shop, from Broderbund. For Apple II series, 48K; Atari, 48K; C 64 (\$44-\$49). Fun utility lets everyone in the family design and print out greeting cards, signs, letterheads. Package comes with special colored paper on which to print creations.

Remember!, from DesignWare (415) 546-1866. For Apple II series, 48K; IBM PC/PCjr, 128K; planned for C 64 (\$79). Electronic flash-card maker provides strategy for memoriz-

ing a variety of facts. Visual, verbal, or auditory hints can be included in powerful package for ages 12 and up.

LANGUAGE ARTS



Cave of the Word Wizard, from Timeworks (800) 323-9755. For C 64 (\$24). A sure-fire way to get anyone from age 6 to adult to practice and learn 500 frequently misspelled words at 10 different difficulty levels. Joystick-operated game makes good use of C 64's voice synthesis.

The Grammar Examiner, from DesignWare. For Apple II series, 48K; C 64; IBM PC/PCjr, 64K (\$44). As a journalist, you proofread, passages, check grammar, punctuation, and capitalization, moving around a game board and increasing your salary to be appointed editor-in-chief. For ages 10 and up.

Kermit's Electronic Story Maker, from Simon & Schuster. For Apple II series, 48K; C 64 (\$29-\$34). Miss Piggy, Kermit, and friends fly, bounce, run, and cavort through a number of different scenes in a colorful, musical, introductory reading package.

Reader Rabbit and the Fabulous Word Factory, from The Learning Company (415) 328-5410. For Apple II series, 48K; C 64; IBM PC (w/color card)/PCjr, 128K (\$39). Four fun games for early readers, ages 5-7, reinforce basic reading skills. Colorful animation appeals to younger players while older children can play at more challenging levels.

Snoopy's Reading Machine, from Random House Software (800) 638-6460. For Apple II series, 48K; IBM PCjr, 64K; C 64 (\$29-\$39). Accompanied by the "Peanuts" clan, beginning readers practice one-syllable words grouped in five different word families. Great graphics and fun music motivate ages 4-7.

Spell It!, from Davidson & Assoc.

(213) 373-0971. For Apple II series, 48K; C 64; IBM PC/PCjr, 64K (\$49). Kids 10 and up (younger in some cases) practice spelling in four activities and two fun games, using 1,000 different words in 50 lists, or words you enter yourself.

Story Maker: A Fact and Fiction Tool Kit, from Scholastic Software. For Apple II series, 48K (\$39). Story processor lets kids stamp pictures, draw their own, and add text in different styles, and even print out creations. Good creative activity for kids as young as 6 (with adult help).

That's My Story, from Learning Well (800) 645-6564. For Apple II series, 48K; IBM PC/PCjr, 128K (\$59). Kids age 7 and up build on preprogrammed stories or write their own with easy-to-use creative writing package that uses a "What if . . . ?" format for plot twists and branches. Best for kids and adults who like to write.

Wizard of Words, from Advanced Ideas (415) 526-9100. For Apple II series, 48K; C 64; IBM PC/PCjr, 128K (\$39). Kids ages 5 to adult and word lovers of any age practice spelling, logic, and reasoning skills in series of five fun word games. Program includes option to make up your own word lists for use in two games.

Word Attack!, from Davidson & Assoc. For Apple II series, 48K; Atari, 48K; C 64; IBM PC/PCjr, 128K (\$49). Study close to 700 words in nine lists of varying levels of difficulty. Use multiple-choice quiz, fill-in-the-blank test, and an arcade game. Having mastered the words provided, you can add your own.



Algebra Arcade, from Wadsworth Electronic Publishing (408) 373-0728. For Apple II series, 48K; C 64; IBM PC/PCjr, 64K/128K (\$49). Write algebraic equations, which the computer then plots to create graphs to pass through as many "algebroids" as possible. Entertaining game includes many different play options; is an excellent vehicle for graphing and practice with algebraic equations.

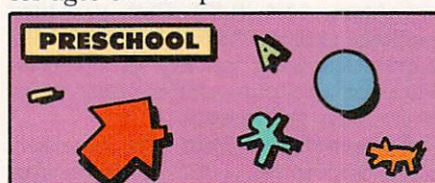
Cell Defense, from HesWare (415) 871-0570. For C 64 (\$14). Use joystick to mobilize immune system's defenses and subdue a viral attack on the body. Exciting simulation with fun arcade-like feel really teaches about immunology.

Math Maze, from DesignWare. For Apple II series, 48K; Atari, 48K; C 64; IBM PC (color card required)/PCjr, 128K (\$39). Kids ages 6-11 travel

through mazes, practicing basic addition, subtraction, multiplication, and division skills. Use one of 40 mazes of varying difficulty levels, or create your own.

Microbe: The Anatomical Adventure, from Synergistic Software (206) 226-3216. For Apple II series, 48K (\$44). Younger kids may need help, but teens and adults will learn all about human anatomy and medicine as they travel toward the brain of an injured patient to treat the source of one of several illnesses, while fending off attacking immune systems.

T. rex, from CBS Software (203) 622-2500. For Apple II series, 48K (\$49). You are a tyrannosaurus and must survive in an authentic prehistoric habitat. Fascinating simulation encourages exploration, and teaches about dinos, ecosystems, and more, for ages 8 and up.



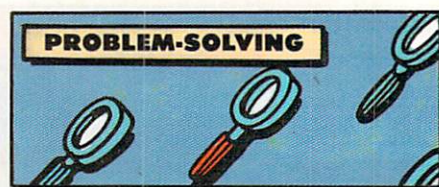
School age kids aren't the only ones served by top-notch educational packages. Here are the programs selected as "Best of the Best" by our reviewing families with preschool-aged children.

Fuzzywomp, from Sierra (209) 683-6858. For Apple II series, 48K (\$29). Four activities teach counting, number sequence, and pattern-matching skills. Play advances gradually as child's skill improves. Well-planned so preschoolers won't outgrow it quickly.

Kindercomp, from Spinnaker Software Corp. For Apple II series, 48K; Atari (cart. and disk); C 64; IBM PC/PCjr, 64K (\$29 for disk, \$39 for cart.). Prereading, premath, and pattern-recognition games and activities introduce 3-8-year-olds to the computer keyboard.

Early Games For Young Children, from Springboard Software. For Apple II series, 48K; Atari, 48K (disk and cass.); C 64 (disk and cass.) IBM PC/PCjr, 64K (\$34). Preschoolers learn fundamental prereading and math skills and draw pictures with a series of simple lo-res games. Activities also familiarize children with computer keyboard.

Getting Ready to Read and Add, from Sunburst Communications (800) 431-6616. For Apple II series, 48K; Atari, 48K; C 64; IBM PC/PCjr, 64K/128K (\$44). Prereading and math activities make for a good introduction to the computer keyboard, as well. Shape- and letter-matching, simple counting, and left-to-right movement presented.



Pipes, from Creative Software (408) 745-1655. For C 64 and VIC-20; IBM PC/PCjr, 128K (\$14-\$24). Kids control plumber with joystick and lay pipes to connect houses with the town's new water supply in clever, problem-solving program best suited for preteens.

Rocky's Boots, from The Learning Company. For Apple II series, 48K; C 64; for IBM PCjr from IBM (\$49). Kids 7 and up are introduced to electronic circuitry in activities and puzzles that build logic skills, preferable for children over 10.


Robot Odyssey I, from The Learning Company. For Apple II series, 64K (\$49). Design and test circuit chips and build robots to aid in your ascent out of an underground city. Sharp preteens and up learn about circuit design and practice problem-solving.

Agent USA, from Scholastic Software. For Apple II series, 64K; IBM PC/PCjr, 64K with color graphics card (\$39); Atari, 48K (\$29); C 64 (\$29). Children ages 9 and up learn location of major cities, states, and capitals in the United States by traveling across the land in pursuit of a mysterious force infecting the population.

Snooper Troops #1, from Spinnaker Software Corp. (617) 494-1200. For Apple II series, 64K; Atari, 48K; C 64; IBM PC/PCjr, 64K (\$27-\$33). Kids ages 10 and up (and adults) practice the art of deduction, problem-solving strategies, logic, and note-taking skills while trying to solve the mystery of a seemingly haunted house.



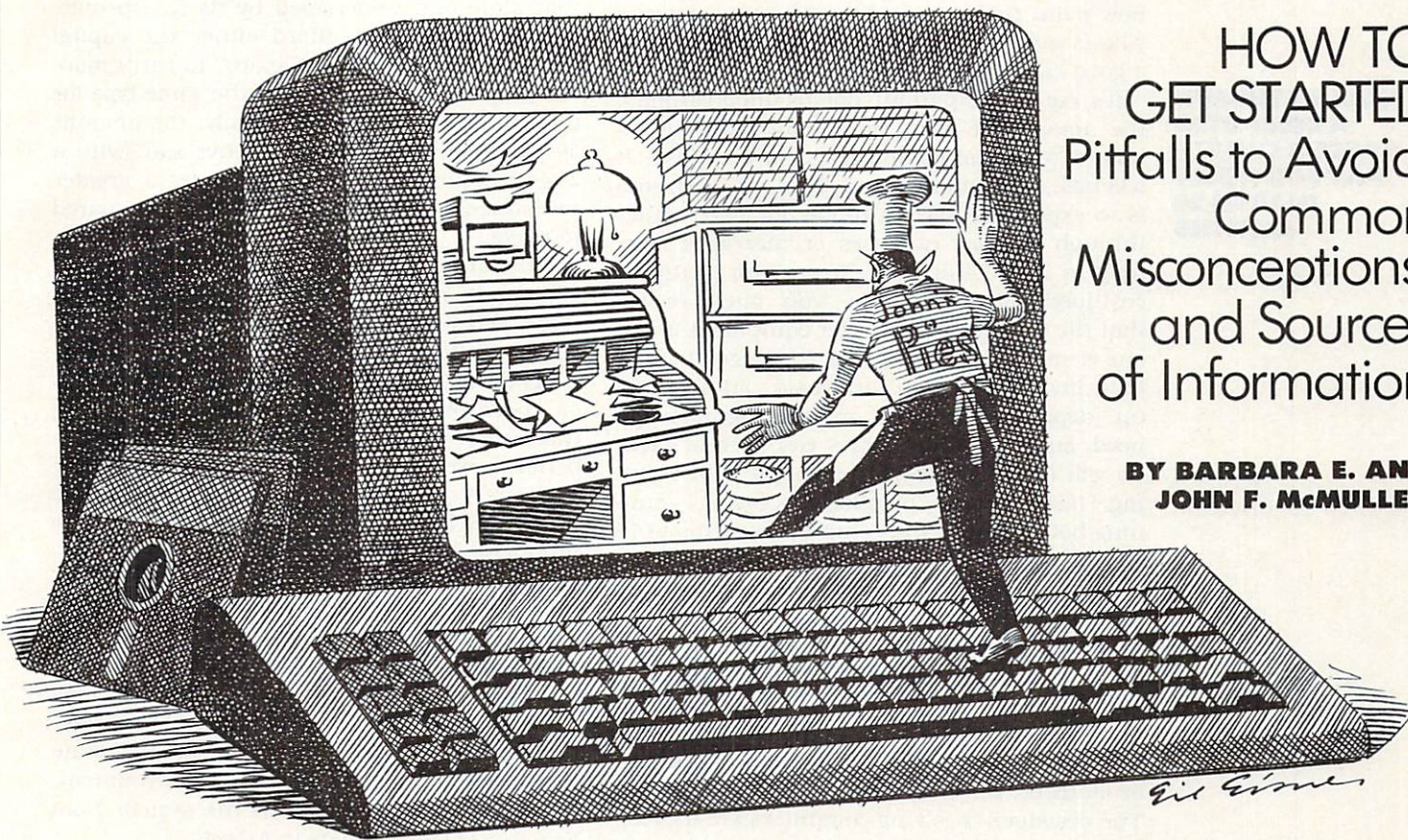
MasterType, from the Scarborough System (914) 332-4545. For Apple II series, 48K; Macintosh; Atari, 48K; C 64; IBM PC/PCjr 64K (\$39-\$49). Shoot down "enemy words" by accurately typing letters and words that appear in quick succession in the screen's corners.

Typing Tutor III with Letter Invaders, from Simon & Schuster. For Apple II series, 64K; Macintosh; C 64; IBM PC/PCjr 64K (\$39-\$59). Comprehensive tutorial includes finger lessons, practice, graphs of progress in timing and accuracy, plus bonus arcade-style game. 

Computerizing Your Small Business

HOW TO
GET STARTED
Pitfalls to Avoid,
Common
Misconceptions,
and Sources
of Information

BY BARBARA E. AND
JOHN F. McMULLEN



You run a little business out of your home. Or you moonlight. Or you've got a Mom-and-Pop shop down the street. And you think computers can help with the paperwork and numbers. You're right. But it's not necessarily going to be easy.

Nowhere has there been more promise for microcomputers than in the small-business world. From the advent of the early Altairs, Apples, and Commodore PETs, industry observers have expected microcomputers to perform the same functions for small businesses that minicomputers and mainframes have performed for large corporations. Unfortunately, these expectations have never been fulfilled completely. This article will examine some of the reasons why, and pinpoint some of the

actions that you may take to overcome the various pitfalls and get started on the right foot.

The major difficulties in computerizing any kind of business venture—whether it's a weekend affair you run out of a garage, or a bona fide operation with several employees—usually result from some combination of the following factors:

1. Your own unrealistic expectations
2. Inadequate advice and information
3. Inadequate software documentation
4. Instability of computer and software manufacturers

While none of these difficulties is insurmountable—and, in fact, computers benefit virtually every businessperson who uses them—the problems and frustration they can

BARBARA E. and JOHN F. McMULLEN are authors of *Microcomputer Communications, A Window on the World* (John Wiley & Sons), and cofounders of the consulting firm McMullen & McMullen Inc. They wrote "Office Work At Home" in the July issue.

create are sometimes big enough to make the businessperson throw up his or her hands and abandon the whole project.

GREAT EXPECTATIONS

Many people have overblown expectations of what a computer can do for them, and how easily it can do it. This is largely because most small-business owners have had no exposure to computers before attempting to introduce them into their business. They are, therefore, fair game for the ads that show a business in total chaos until the owner rushes to his nearest computer store and purchases a computer that not only immediately puts the business in order, but allows it to triple its sales (and somehow paint the store and hang a sign). Anyone who is influenced by this type of advertising is a good candidate for disaster.

It's equally important not to underestimate the amount of hard work and planning required to install computers in a business. It will take time and money. A good rule of thumb is to expect the system to pay for itself either through reduced expenses or increased revenues in 18 to 24 months. To perform a rational cost-justification analysis, you must realize that the cost of the computer equipment is but one element (and not always the largest) of the total investment. Software costs can also add up, depending on how many programs you need, and how many copies you need of each. So will the internal costs involved with training, testing, and "parallel processing"—running both manual and computer systems until all the kinks are worked out.

Finally, if computers are not the whizz-bang, workhorses many people expect, neither are they the difficult, arcane machines that "regular people" need shy away from. A common misconception is that the person using computers must understand mathematics or electronics or something called "programming"—or all three. Nothing is further from the truth. The decisions involving computers are basically business decisions. The prospective user must understand the work to be automated and the benefits of such automation. People who try to computerize when they don't understand the work flow inevitably run into problems. Only by understanding a business' manual systems can you hope to choose the right software and computer system.

START WITH SOFTWARE

Where can you turn for help? The obvious place would be the local computer store. Tom Ittelson of Metallon Engineered Materials Corp. in Pawtucket, Rhode Island, who has been using an IBM PC for a little over a year for accounting, word processing, spreadsheet analysis and data-base activities (and is generally satisfied with the use of computers), sees it another way. "Basically, I've found that computer stores are undercapitalized. The sales-

people don't know how to assemble the hardware, much less understand the software."

While Ittelson's statement may seem somewhat extreme to those who have been satisfied with their computer-store dealings, there is a great deal of truth in it. The proper path to follow in choosing a system is to select the software that will best perform the function to be automated, and then to purchase the appropriate "hardware" to run the selected software.

To do this properly, the would-be purchaser must be able to review various software products to determine the one that best fits the task. There are now tens of thousands of business programs, but the prospective buyer in a computer store is limited to those carried by that store and understood by its salespeople. The retailer cannot afford either the capital expenditure or the "shelf space" to carry more than one or two programs of the same type for the same computer. Additionally, the amount of time required to become conversant with a large number of programs requires a greater investment than the average dealer is prepared to make.

Thus, if the customer wishes to do word processing, he may be sold *Microsoft Word* or *Lifetree's Volkswriter Deluxe*, which are both excellent products and found in many stores. But if his or her real need is to collect lots of notes or "boilerplate" paragraphs and then bring them together in final documents, he may be better served by *Nota Bene* from DragonFly Software (in Brooklyn) which most salespeople won't have heard of. If he wishes to manipulate numbers, he will invariably be sold the big-selling *Lotus 1-2-3*, but if his real need is to solve engineering or financial equations, he would be better served by *Lotus' TK!Solver* or *Alloy's Formula One*.

If he needs an accounting system, he may choose between programs from Peachtree, Open Systems, or MBSI, but if he must operate in a fund (nonprofit) accounting environment, he would be better off with the system from Executive Data Systems in Atlanta.

The user who purchases a good product that is somehow inappropriate for his needs may muddle through to an acceptable solution, but will never be as well served as if he had started with the right product.

FINDING INFORMATION

As a businessperson, you must treat the software selection process in the same fashion that you would treat any other business decision—gather all possible facts from all possible sources, just as you would if acquiring a new office location.

If computer stores cannot always be counted on to provide proper direction, how is a businessperson to obtain the information to make intelligent decisions about computers? There are a variety of ways and all should receive attention.

**RULE OF THUMB:
A COMPUTER
SYSTEM SHOULD
PAY FOR ITSELF
IN 18 TO 24
MONTHS**

1. Consultants. There are many capable firms and individuals who have installed computers in specific industries. While the use of such consulting services will reduce the time and research required, the user must be prepared to shoulder a significant expense (comparable to accountant and lawyer fees). From our vantage point, as principals in a consulting firm, we of course feel that such monies are generally well spent, as the initial expense may save much larger expenditures should an inappropriate system be installed.

Care must be taken, however, to ensure that the consultant selected truly understands the business aspects of the problem and is not merely a programmer who wishes to write a "custom" program for every problem. In most cases, it will be much more efficient and economical to work with "off-the-shelf" software and modify it as necessary.

Get recommendations and check previous installations before hiring a consultant.

2. Trade Organizations. Many industry groups, such as the National Savings and Loan League, The New York Society of Security Analysts, and various groups of insurance agents, regularly sponsor seminars on the uses of microcomputers in their industry.

3. User's Groups. In most areas, user's groups have banded together to exchange information about specific computers. Large user's groups also tend to have specialized subgroups (e.g., accounting, word processing, investments, etc.). Patterson Smith, owner of a rare book business in Montclair, New Jersey, found that the Big Apple Users Group (BAUG) in New York City provided him with access to persons who had experienced, and overcome, the same problems he was encountering.

4. Schools. Most colleges and universities now hold courses (at very reasonable prices) on the use of computers in business. The information gathered in such courses often protects the businessperson from multithousand dollar errors. In addition to courses at accredited institutions of higher education, there are also seminar programs offered by various local organizations.

5. Magazines and Books. Magazines, such as *Wall Street Computer Review* and *Medicine & Computers*, deal with the use of computers in specific industries. *The Book of IBM Software* (\$19.95) and *The Book of Apple Software* (\$24.95, Arrays, Inc./The Book Division) provide good listings of software. Bowker's *1985 Complete Sourcebook of Personal Computing* (\$19.95, R.R. Bowker Co.) is a comprehensive guide to computers, software, books, magazines, and user's groups. Once software is selected, some companion books for the particular software are quite useful. Douglas Cobb's books on *Lotus 1-2-3* (\$16.95, Que Corp.) and David Ewing and Geoffrey LeBlond's book on *Symphony* (\$19.95, Que Corp.) are excellent.

THE LEARNING CURVE


Once programs and equipment are chosen (See "Buyer's Guide to Business-Related Hardware" in the upcoming October issue.), a whole new set of problems may arise. If you have a staff, you'll have to train people to use the system, and attempt to demonstrate some of the benefits inherent in automation. Amanda Cross, of Boston's Cross & Chartoff Assoc., consultants to the publishing industry, notes: "Some people working with computers don't even know how to make backup copies of programs. This is often the fault of the employer who is willing to spend \$10,000 for hardware, but not \$2,000 to train employees."

Another oft-experienced problem is poor software documentation. The programs chosen for a particular function may be quite adequate, but the documentation that supposedly tells you how to operate the system can be woeful. Jon Blinder, part-owner of New York's Washington Street Cafe, a catering service, stopped using a certain accounting package on his Commodore 64 after his firm lost a whole quarter's records from its files. He blames that loss on "atrocious software instructions." However, Blinder continues to use the *PractiCalc* spreadsheet program, which he feels has good documentation.

Still other problems may arise due to changes in the industry. A number of manufacturers of personal computers have either withdrawn from the marketplace or changed direction. When such an event occurs, the owner of the equipment often feels like an orphan, unprotected if the hardware fails. (Actually, there is usually more protection available than the user might think, and the feeling of loss is often more psychological than real.)

In the software arena, there's even more instability, with a high incidence of software publisher "shakeout." Vincent Yettito, president of Roto-Grip, a bowling ball manufacturer in Port Chester, New York, remembers feeling victimized when he learned that Dakin, the developer of *Controller*, the program that he used for accounting, had been bought out and then had gone out of business. "You feel totally at the mercy of the computer—there is no one to help you muddle through errors or to send program disks to if they become damaged."

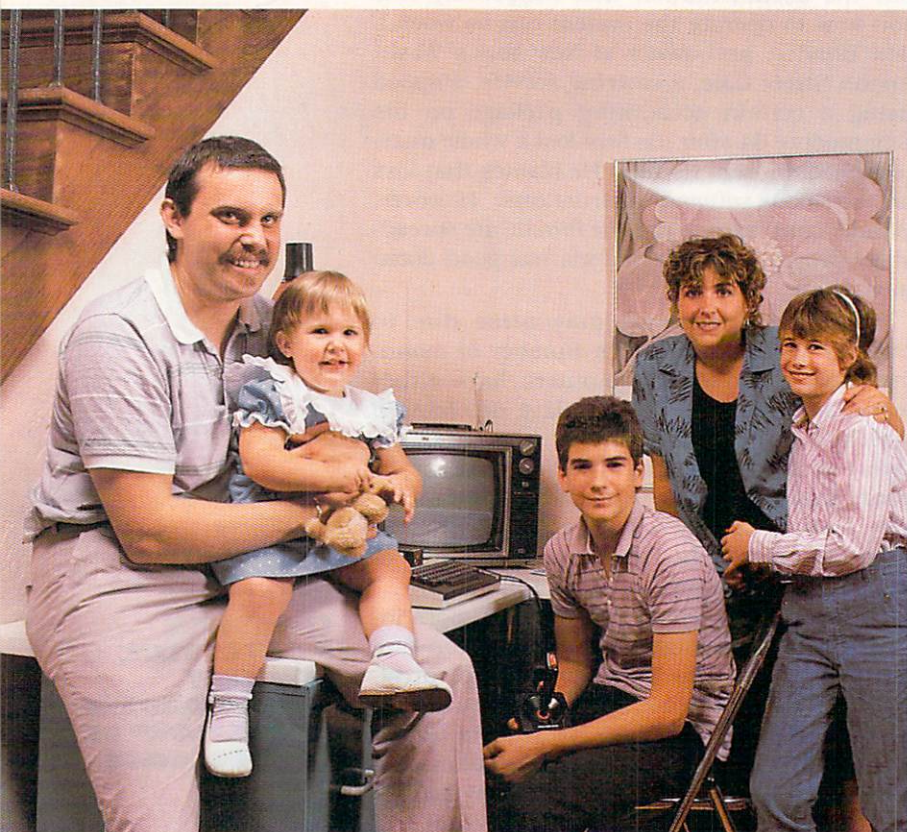
THE BENEFITS ARE LEGION

When presented with all of the trauma that may be associated with the introduction of computers into small businesses, it is important to maintain the proper perspective. *The benefits of computers in small businesses are legion and invariably worth the associated difficulties.* All of the businesspersons quoted in this article (as well as hundreds in our professional experience) feel that the benefits related to computerization have been well worth it. Learn from their mistakes. There's no reason to reinvent the wheel. 

**IN ORDER TO
CHOOSE THE
RIGHT SYSTEM,
YOU MUST
UNDERSTAND THE
"WORK FLOW" OF
YOUR BUSINESS**

1985 COMPUTING FAMILY OF THE YEAR

BY LINDA WILLIAMS



MEET THE MANCINIS OF LONG ISLAND. A COMPUTER CHANGED THEIR LIVES.

"I sometimes think of the evolution of the American family as a unit—first gathering around the fireplace, then the radio, the television, and now the family computer. It seems that more and more of our family activities are centered on the computer. A typical evening involves dinner and cleanup, putting baby Tessa (age 14 months) to bed, and then homework.

"I feel that computers are fast becoming essential to any household. Without an exposure to computers at home our children would be out of touch with the computerized world in which they live. Our banking has been computerized, the supermarket is being computerized, and the family's business specifically addresses the data-processing industry. By enjoying the computer on a personal basis and together as a family we are helping our children to feel completely comfortable in this computerized world." —KATE MANCINI, 34, in her winning entry

Meet the Mancinis, voted by our panel of judges as FAMILY COMPUTING's Computing Family of the Year. After poring over entries from families across the nation and beyond (as far as Germany, Africa, and the Pacific Islands), we chose the Mancini family of Rockville Centre, New York, as the best example of the modern computing family.

Not only has the computer captured the interest and challenged the patience and imagination of each family member, it also has drawn them closer, giving them common problems to tackle, adventures to solve, and activities to enjoy. The computer has changed the Mancinis' lives.

When we called the Mancinis, we offered them a week at a Club Med Computing resort or one of the computer systems they mentioned a yearning for in their entry. They selected a computer—the Macintosh.

"We didn't have any second thoughts about it," said Richard, 33. "When Matthew (age 14) came home from school, we told him we'd won [and about the choice], and his jaw about fell to the ground. 'Wow, a Macintosh!!'"

For families like the Mancinis, upgrading to a more powerful, versatile computer is a natural step. Like many of our readers, the Mancinis built their system piece by piece, starting with a low-cost CPU and some game cartridges, and adding peripherals as their budget and computer literacy increased.

BENEFITS OF COMPUTING

Back in the fall of 1983, Matthew wanted a computer more than anything else; he'd had hands-on experience at a friend's house and at school. Kate and Richard gave in. They bought their son an Atari 600XL for Christmas. Matthew took pride in his gift and facility with it, and taught Shannon (then 7) to play games on cartridge. Kate and Richard quickly noticed that the machine drew their elder children together. "Even now, the computer [station] is the one place Shannon and Matthew don't argue," Kate said. "They love playing verbal games together—using their imaginations."

Kate and Richard didn't stay away from the computer for long. "At first I had the feeling that the computer was so technical it would take me forever to feel comfortable with it," Kate said. "But the kids sat me down and taught me games, and I saw that things would be easier than I thought."

Kate and Richard soon recognized the computer's place in their business, a consulting/job-placement firm started in 1981. "We can't place people in data-processing jobs without a knowledge of what the jobs entail," Kate said.

The addition of a cassette drive several months later opened doors to more software, but it wasn't until a full year later, when the family could afford a disk drive, that the computer bug infected the family irrevocably. The

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Indus drive, packaged with word-processing, spreadsheet, and data-base software, gave new meaning to their concept of computing. Through word processing, both Shannon and Matthew learned to type and started writing stories; Richard shaved hours off his workday, which involves writing resumes, personality profiles, and seminars for their business.

With the computer and educational software, schoolwork became less of a chore and more of a family activity. Shannon was having trouble in third grade with math—learning the multiplication and division tables, and understanding some of the basic concepts. “We started her out with CBS’ *Success With Math*, which to Shannon was more like a game,” Kate said.

“Shannon loved using it,” Richard added. “She’d say, ‘Hey, Dad, come load up the math game for me.’” Her math skills improved quickly and markedly, because it wasn’t a chore to work at them. Even Shannon’s teacher noticed her progress and began recommending the software to other parents.

Though the family was happy with its growing skills, it still needed a few more peripherals to make the computing home complete. Matthew launched a campaign for a modem—his friend Marc owned one, and Matthew dreamed of projects they could complete by telecomputing. Kate shared his dream when she found a modem would let her finish her college degree: She learned of a university that allows its students to hand in assignments and “speak” with teachers via a computer, over phone lines.

Although they also wanted a letter-quality printer, the Mancinis decided a modem was the most practical next purchase. As soon as they bought it, Kate entered The American Open University, a branch of the New York Institute of Technology in Brookville, Long Island. As she explained, it’s a nationwide, fully accredited program designed to allow busy people to earn college credit through the use of computer teleconferencing.

ONLINE STUDYING

“Commuting to school on a regular basis and being committed to specific class hours would be next to impossible,” Kate said. “It’s thrilling for me to sit down at my Atari at any time of the day or night, switch on my modem, and interface with my professors.” At her college-by-computer, Kate can exchange electronic messages with professors and “classmates,” and join a number of ongoing conferences.

“Now I can tap into school whenever I want, which usually means between 11 p.m. and 2 a.m. Sometimes when it’s 2 a.m. and I’m inputting a homework assignment, I wonder, ‘Why am I doing this?’ But for the most part I’m so happy to be back in school, and without the computer it wouldn’t be possible.”

When she gets her BA in psychology—in about 2½ years—Kate says she plans to go on for an advanced degree! She hopes eventually to use the computer in her own psychotherapy


practice. “There are endless possibilities for using the computer with emotionally disturbed children,” she said.

Matthew gets his share of time on line, too. He currently is writing a “Choose Your Own Adventure” book with his friend Marc; each boy sits at his family’s computer, sending ideas and files to the other via modem. Since that work takes up so much time, Matthew had been saving up to buy his own Apple computer. So he’s especially thrilled about the prize.

“I was happy with the Atari, but it just wasn’t enough,” he said.

The next stage of their computing life? Music! “We’re researching music software and peripherals such as electronic piano keyboards,” Kate said. “The unlimited potential of electronic music technology excites us. Creating music as a family is a wonderful experience in itself. Combining it with our enthusiastic interest in computers will heighten that experience.”

When speaking of upgrading to a more powerful computer, the Mancinis’ voices swell with excitement. Richard beams when he thinks how a more advanced data base will allow for larger files and cross-referencing of job candidates and positions—and the ways a spreadsheet will ease his accounting work. “I get so enthusiastic because technology is such a turn on,” he said.

Kate’s just pleased that her family can be “comfortable and familiar with the world around us,” she said. And before long, her family will be enjoying a new computer system—and teaching the youngest family member, Tessa, the wonders of its technology. 

CONTEST WINNERS

Grand Prize, A Macintosh Computer System: Richard and Kate Mancini and their children, Matthew, Shannon, and Tessa, of Rockville Centre, New York.

First Prize, A Computer System: Sunow and Spirit Bradley and their five adopted and seven foster children, of Glendale, Oregon.

Second Prize, A Printer: Lois and Larry Gelzer and their son, Henry, of Oak Bluffs, Massachusetts; and Jerry Chinn and Donna Dapra-Chinn and their daughter, Jacque Dapra, of Pasadena, California.

Third Prize, A Monitor: Leslie and Clifford Siskin and their children, Corin, Nathaniel, and Johanna, of Southfield, Michigan; and Jim and Carroll Fox and their sons, Tim and Mark, of Battle Mountain, Nevada.

Fourth Prize: The Hunters of Arlington, Virginia; the Johnstons of Maryville, Tennessee; the Fletchers of San Francisco, California; the Carlsons of Loveland, Colorado; the Kingsleys of Chappaqua, New York; the Gables of Mt. Carroll, Illinois; the Berghs of Pleasanton, California; the Robertsons of Agoura, California; and the Christies of Tulsa, Oklahoma.

THE COMPUTER HAS DRAWN THEM CLOSER, GIVING THEM COMMON PROBLEMS TO TACKLE, ADVENTURES TO SOLVE, AND ACTIVITIES TO ENJOY.

COMPANIES CONTRIBUTING PRIZES: Activision, Advanced Ideas, American Educational Computer, Avant-Garde, Amdek, Arrays/Continental, Atari, Avalon Hill, BHT Group, Brady, Broderbund, CBS, Commodore, Creative Software, Datamost, DesignWare, dillithium Press, Electronic Arts, Epyx, Ergo Systems, Eric Software, First Star, Fuji, Gamestar, Harper & Row, Hayes Microcomputer Products, Inc., Human Edge, Imagic, Infocom, Koala, The Learning Co., Maxell, Maximus, MECA, Micro Lab, Microsoft Press, Mindscape, Monogram/Tronix, Okidata, Peachtree Software, Penguin, Personal Peripherals, Random House, Recoton, Reston, Howard W. Sams, Scarborough, Scholastic Software, Screenplay, Smith-Corona, Springboard, Star Micronics, SubLOGIC Communications, Suncom, Synapse, Taxan.

BUYER'S GUIDE TO

LOW-COST PRINTERS



BY
JOE
GELMAN



YOU CAN FIND LETTER-QUALITY, HIGH-SPEED DOT-MATRIX, AND COLOR PRINTERS FOR LESS THAN \$400

While computer prices have dropped steadily for the past two years, the cost of printers hasn't fallen quite so fast. Lower costs for microchips have allowed computers to sell at almost unbelievable prices, but the number of working mechanical parts in printers—gears, pulleys, and motors—has kept the price up. Nonetheless, there's good news if you're ready to add a printer to your computer system: High-quality printers of every type are now available at the lowest prices ever.

Almost every major printer manufacturer that caters to consumers has a model that lists for less than \$400. The retail, or "street," price of most models is even less, with the actual cost between \$200 and \$350. And for this you'll be getting a faster printer with more features than models that sold for more than \$500 just two years ago.

PRINT OR PERISH

Adding a printer to your computer system opens up the world of word processing (fun, but not very useful without a printer), and lets you produce permanent copies of your program listings and data-base records. In many cases, any graphic images viewable on your computer screen can be transferred to paper with special "screen-dump" software and a dot-matrix printer. Some printers can even do it in color!

Before setting out to buy a printer, you'll first have to determine the main purpose for which you'll be using it. If your primary use is to print business correspondence and produce copy that looks typewritten, you'll probably want a letter-quality printer. For general use (program listings, graphic printouts, long manuscripts, or short memos) a dot-matrix is more suitable. For occasional use, or portability, or if noise is a factor, a thermal might better fit the bill. If you want color, of course, you'll need a color printer. Ink-jet and laser printers, relatively new and emerging print technologies, are not covered in this guide, due to their high price. (See the *Buyer's Guide to Business-Related Hardware*, in the upcoming October issue.)

Letter-Quality Printers. The print quality of a typewriter is considered "letter quality," and is the standard by which computer printers are judged. On a letter-quality printer, each character is cast in plastic or metal, and reproduces perfectly on paper. Most letter-quality printers use a spinning daisywheel or thimble to duplicate the function of typewriter hammers; by changing the daisywheel or thimble, you can change print styles.

JOE GELMAN, contributing technical editor (emeritus), has written several *Buyer's Guides* and product reviews for FAMILY COMPUTING over the past year.

Most letter-quality printers in the \$400 range have 96-character daisywheels (uppercase and lowercase letters of the alphabet, the full number set, and miscellaneous symbols). However, these daisywheels are often "one of a kind," and thus usually not interchangeable from one printer to another. (Qume and Diablo are standard daisywheels that can be found in many stores.) The penalties for the crisp, attractive output of a letter-quality printer are slow speed (10–20 characters per second in the under \$400 category) and the inability to print out hi-res graphics, or drawings.

Dot-Matrix Printers. Dot-matrix printers are fast and versatile. Characters are produced by a vertical row of "pins" mounted on a moving printhead. As the printhead moves across the page, individual pins "fire," and strike a ribbon.

The printer controls the pattern of firing to produce the desired character. Since there are no "preformed" characters, the printhead can be programmed to produce any image desired. In fact, many dot-matrix printers include multiple fonts and foreign character sets as a standard feature. Moreover, dot-matrix printers can produce high-resolution graphics.

Some software, such as the best-selling *Print Shop* (Broderbund Software, \$45–\$49), which produces customized greeting cards, posters, and letterheads, and *The Newsroom* (Springboard, \$50), which allows you to create a newspaper, are specifically designed to be used with dot-matrix printers.

Thermal and Thermal-Transfer Printers. These printers also use dots to form characters and images, and are thus technically dot-matrix printers. But heat—and not mechanically fired pins—is used to create characters.

Thermal printers, such as Ergo Systems' HUSH-80, are popular because they are light and have low power consumption. The Epson PX-80, for instance, can be powered by five batteries. This also makes the printers portable. Thermal printers are quiet, with no clanging printheads to jar you. While they don't require ribbons, they do require the use of special heat-sensitive paper. This can be hard to find, is more expensive than regular paper, and since it comes in rolls, tends to curl when torn off.

Thermal-transfer printers, such as the Okimate 10 and 20, and Apple Scribe, melt wax, releasing ink from the ribbon onto the paper. The thermal-transfer process works best with a special glossy paper, though standard paper can also be used. Many thermal-transfer printers offer the option of printing in color using special ribbons (see the *Buyer's Guide to Color Printers* in the April issue). The

main disadvantage of thermal-transfer printers is the need to replace ribbons frequently.

SPECIAL EFFECTS

Computer printers can "dress up" work more than most typewriters can. It's possible to change print styles mid-way through a document, underline, use boldface, condensed, or italic type, etc. Of course, not all printers can do all these things. A letter-quality printer will print out only those characters already on a particular daisywheel or thimble. In the chart, we note the number of characters on a given printer's "print element," and the number of such elements available.

Most letter-quality printers can quite easily produce the most important effects (underlining and boldfacing, etc.), and can print both pica and elite characters (10 per inch and 12 per inch, respectively). With the proper print elements, some can do subscripts and superscripts, italics, and proportional spacing. The latter function closes up space so that skinny characters ("i," "l") don't look like they're standing in a desert.

Dot-matrix printers (impact and thermal) are capable of a much wider variety of print options. In addition to the above functions, most dot-matrix printers offer condensed and elongated print styles as well (see *print samples*). These features are not listed in the accompanying chart; if they're important to you, make sure they're found in the printer you choose. Though dot-matrix printers can do many different styles, getting your printer to work with a particular piece of software is not always an easy task.

Near-letter-quality. Can you have your cake and eat it too? That is, can you get letter-quality output without sacrificing the versatility of dot-matrix? If you're not super critical, and don't need the very best quality, the answer is, Yes! Many of the newest dot-matrix printers sport a "near-letter-quality" mode that is quite acceptable. While in normal "draft" mode, the printer operates at full speed. When switched into near-letter-quality mode, the print-head strikes the same area twice, at a slight offset, resulting in a sharper image. This double pass can slow the printer to as little as one-quarter of its normal speed, but the results are worth it. In short, the space between the dots is smaller and less noticeable. Note that many printers have "double strike" and "emphasized" modes, which are similar but not the same as "near-letter-quality."

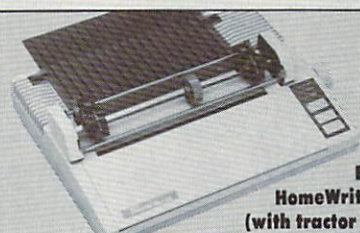
INTERFACES: COMPATABILITY!

Choosing a printer is not quite as simple as picking the one that tickles your fancy. You'll have to make sure it will connect to and communicate properly with your computer. Most printers come with a Centronics-parallel connector as standard equipment, and an RS-232C serial connector as an option.

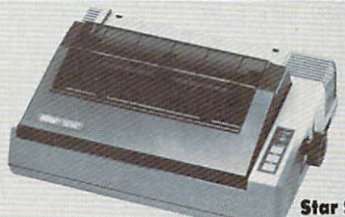
Of course, many computers don't use these standard connections, but their own proprietary interface. Owners of Apple IIc, Atari, TRS-80 CoCo, and Commodore computers can buy printers specifically designed for those units. Each of those companies, as well as third-party vendors, market printers that include an interface and connect directly to the computer (see *chart*). Epson's Homewriter 10, for instance, is sold with Printer Interface Cartridges (PICs) for various computers. These cartridges fit into the Homewriter, customizing it to print a particular computer's character set, and have a tail-like cable attached that plugs directly into the computer.

Software compatibility. You command the printer to change print styles or to perform other special functions by instructing the computer to send it special control codes. You can do this with BASIC commands, or through commercial software. If you already have a favorite word processor or other software that requires a print-

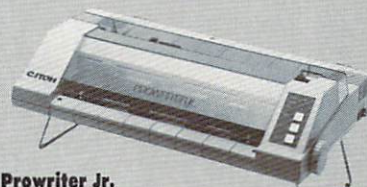
Silver-Reed EXP 400



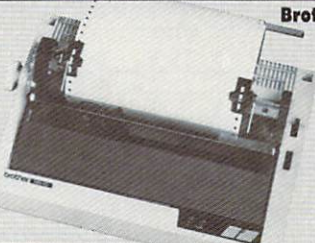
Epson
HomeWriter 10
(with tractor feed)



Star SG-10C

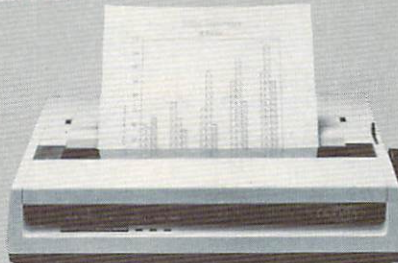


C. Itoh Prowriter Jr.



Brother HR-10

Okidata 120



WHAT DOT-MATRIX CAN DO

This is printed in Pica type/draft mode.

This is printed in Elite type/draft mode.

This is printed in Proportional type/draft mode.

This is printed in condensed mode.

Double-strike is now on.

This is printed in expanded mode.

Here's an example of italics and mixed mode printing.

You can underline for emphasis.

Super and subscripts are useful

for exponents (X^{10}), and formulas (H_2O).

This line is near-letter quality. Note the typewriter-like appearance of the text.

The graphic symbols in this article were created with *The Print Shop* (Broderbund) and *Fontrix* (Data Transforms). They and the text samples were printed out on different dot-matrix printers.

PRINTERS: \$399 AND UNDER

LETTER QUALITY

Company	Model	Price (\$)	Speed (CPS)	# Wheels	# Char.	Interface
Axiom	ELITE-5	319	12	18	96	COM or P
	DX 1500	299	14	18	96	P
	DX 2000	399	20	18	96	P
Brother	HR-10	349	12	23	96 ¹	P or S
Epson	DX-10	299	10	200	96	P
Juki	6000	295	10	6	100	COM, P, or S
Silver-Reed	EXP400	349	10	15	96	P or S

DOT MATRIX

Company	Model	Price (\$)	Speed (CPS)	NLQ	Ital.	Interface
Axiom	100 SERIES	199	30	N	N	AT, TI, AP, COM
	GP 550 SERIES	299	60	Y	Y	AT, AP, COM, IBM
	SLP	279	50	Y	N	COM, P, or S
Brother	M-1009	249	50	Y	N	P or S
Centronics	GLP	299	50	Y	N	P; S opt.
C. Itoh	PROWRITER JR.	299	105	Y	Y	P
	RITEMAN C+	299	105	N	Y	COM
	RITEMAN BLUE+	349	140	N	Y	P or S
Commodore	MPS802	170	60	N	N	COM
Comrex	CR220	199	50	N	N	COM
Dynax	DM-5	235	50	N	N	P or S
Epson	HOMEWRIER 10 ¹	299	100	Y	Y	AT, IIC, PCjr, COM
	LX-80	299	100	Y	Y	P or S
	LX-90 ¹	389	100	Y	Y	PC/PCjr or IIC
Legend	880	279	100	Y	Y	P; S opt.
	1080	339	140	Y	Y	P; S opt.
Okidata	MICROLINE 182	299	120	N	Y	P; S opt.
	120	269	120	Y	N	COM
Panasonic	KX-P1090	299	96	N	Y	P or S
Protecto	COM-STAR+	199	130	N	N	P
Radio Shack	DMP-120	299	120	N	N	P or S (CoCo)
Smith-Corona	D-100	295	120	N	Y	P; S opt.
Star	SG10C	339	120	Y	Y	COM
Micronics	SG10	299	120	Y	Y	P; S opt.

THERMAL

Company	Model	Price (\$)	Speed (CPS)	NLQ	Ital.	Interface
Apple	SILENTTYPE	395	40	Y	Y	P
Ergo Systems	HUSH-80 CD ²	140	80	N	N	COM
	HUSH-80 ²	160	80	N	N	P or S
IBM	PC COMPACT PRINTER	175	50	N	N	S
Radio Shack	TP-10	99	30	N	N	S (CoCo)

THERMAL TRANSFER

Company	Model	Price (\$)	Speed (CPS)	NLQ	Ital.	Interface
Apple	Scribe ³	299	80	Y	Y	S
Epson	P-80 ²	250	45	N	Y	S
	P-80X ²	379	40	Y	Y	S
General Electric	3-8100	259	50	Y	Y	P
Okidata	OKIMATE-10 ³	238	60	N	N	AT or COM
	OKIMATE-20 ³	268	80	Y	Y	AP or IBM
Radio Shack	TRP-100 ²	299	50	N	N	P or S (CoCo)

Footnotes/Key

- # Wheels = Number of daisywheels or other print elements available.
 # Char. = Number of characters on print element.
 AT = Atari; COM = Commodore; AP = Apple; P = Parallel; S = RS-232 serial.
 Cables not included in price.
 NLQ = Near-letter quality; Ital. = Italics
 1) Printer Interface Cartridge (PIC) included.
 2) Battery-operated portables.
 3) Color printers; Okimate 10 and 20 include software and interfaces.
 4) Varies.

MANUFACTURERS

APPLE COMPUTER, (408) 996-1010. AXIOM CORP., (818) 365-9521.
 BROTHER INDUSTRY, INC., (714) 859-9700. CENTRONICS INC., (603) 883-0111. C. ITOH DIGITAL PRODUCTS, (213) 327-5939/RITEMAN, (800) 824-3055. COMMODORE BUSINESS MACHINES, (215) 431-9100.
 COMREX, (213) 539-9140. DYNAX, INC., (213) 727-1227. EPSON AMERICA, INC., (800) 421-5426. ERGO SYSTEMS, (415) 786-3746. IBM ENTRY SYSTEMS DIVISION, (305) 998-2000. JUKI INDUSTRIES OF AMERICA, (201) 368-3666. LEGEND PERIPHERAL PRODUCTS, (800) 321-4484. MANNESMAN TALLY, (206) 251-5524. OKIDATA, (609) 235-2600. PANASONIC, (201) 348-7000. PROTECTO, (312) 382-5244. RADIO SHACK/TANDY CORP., (817) 338-2395. SILVER-REED AMERICA, (213) 516-7008. SMITH-CORONA, (203) 972-1471. (800) 962-3000. STAR MICRONICS INC., (212) 986-6770. (617) 329-8560.

er, make sure it can be configured to work with the model you have in mind. Also, if you wish to do a lot of graphics printing, make sure that the printer can print out your computer's full graphics character set.

LOOK MA, NO HANDS!

You've written the Great American Novel on your word processor and now it's time to print it out and ship it off to the publisher. Of course, nothing short of letter-quality will do, and you're well prepared with a stack of 500 sheets of paper. Let's see, at 70 characters per line, 30 lines per page (double-spaced), and a printer that prints 12 characters per second, that will take you about 24 hours to print out. Can't you just see yourself standing over the printer, feeding it sheets of paper? There's a better way.

Some dot-matrix printers come with a "pin-feed" or "tractor" mechanism. Computer paper (the familiar "fan-fold" type with the sprocket holes on each side) is automatically pulled through the carriage by these pins, allowing unattended printing of many pages. (The tractor-feed mechanism, however, often costs extra.) Some dot-matrix printers also include a typewriter-style friction-feed mechanism that allows you to use single-sheet letterhead paper or any other kind of noncomputer paper.

Letter-quality printers usually come with just friction-feed as standard equipment. To avoid the "feed-the-printer" syndrome, you can purchase a tractor-feed (for computer paper), or a "cut-sheet feeder," which automates the process of printing out stacks of single sheets. Cut-sheet feeders, which cost \$200 to \$300, are even available for some dot-matrix printers. If this option is important to you, check with the manufacturer before you buy.

GUIDE TO THE CHART


All the printers in the chart (except the Radio Shack TP-10) will handle 8½-inch-wide paper. (The Brother HR-10 will accept widths up to 12½ inches). There are models available that will handle 15-inch paper and wider, which is useful if you want to print out spreadsheets, but you'll have to pay a bit more for them.

As for price, most of these printers are discounted up to 30 percent through mail-order vendors and computer stores. Many models that list for more than \$399 are available at retail for less than our \$399 cutoff. If you shop around, there are bargains to be had.

CPS. A characters-per-second rate (cps) is given for each printer. However, the actual speed achieved or "throughput" will be less than the rated print speed. That's because the time it takes to advance to a new line, and other factors that may slow the printer, are not included in this figure. (Printers that are "bidirectional," which means the printhead can begin printing from either side of the page, are faster.) Since the linefeed factor affects all printers, however, the cps rating is still valid as a comparison.

For letter-quality printers in this price range, 10 cps is slow and 20 cps is fast. For dot-matrix printers, less than 100 cps is slow.

NLQ and Italics. We've indicated the dot-matrix and thermal printers that sport a near-letter-quality (NLQ) mode. The actual "nearness" to letter quality will be different for each model, so try to obtain a print sample before deciding. Italics is a nice feature that allows you to highlight text. As a rule, if the printer features italics, it has other styles as well.

Interface. Most printers come with a Centronics-type parallel interface, and an RS-232C serial interface as an option. Some provide for both connections. We've indicated the interface options for each printer as well as the computer-specific models that are available. When ordering a printer, make sure you're getting the correct model for your computer. Cables are usually extra. 

MACINTOSH

INFORMATION APPLIANCE FOR THE '80s?

BY CHARLES H. GAJEWAY

Questions about the Macintosh, the computer Apple Computer Inc.'s "betting the company on," continue to fly. Is the Macintosh a true business computer? Is it a good computer for the home? Or is it neither fish nor fowl—not powerful enough for business use and too expensive for the home?

I've been living and working (both at home and at the office) with a Macintosh for more than six months, and I really question the questions. My Macintosh has become my primary work tool now, with my IBM PC and Apple IIe relegated to special tasks. (In price, a two-disk-drive Macintosh system falls between the Apple IIe and IBM PC—about \$2,000 for a 128K system, and \$3,000 for a 512K "Fat Mac.")

There are a lot of reasons why I became a "MacNut," and why I think the Macintosh is the premier personal computer available today—for people who want to get work done. This can be writing, number crunching, planning, designing, typesetting, you name it. And it can be done at home or in an office. Wherever it is and however you can use it, I think of the Mac as an "information appliance."

EASY DOES IT

The most obvious factor that makes the Macintosh so utterly simple to use is the innovative mouse-driven operating system, called *Finder*. The icons (little symbols of wastebaskets and file cabinets that you point-and-click at with the mouse), and the pull-down menus and windows mean you don't have to learn any complicated commands or DOS routines to operate programs. And since most programs are written to take advantage of these tools, the consistency of operation from program to program makes learning and using the Macintosh easy and fun.

Some people express doubts about the mouse, feeling that it's confusing to take their hands from the keyboard. For a day or two, that's true; I



did keep looking for cursor keys, and I did keep groping on my desktop for the mouse. But that rapidly faded, and now I feel limited and slowed down when I have to use a cursor-oriented machine. The mouse is so natural and powerful that I am considering adding one to my IIe.

PRETTY PICTURES

The unique graphics and super-sharp display contribute greatly to the Mac's ease of use. The black-on-white display and utterly crisp resolution make the longest sessions fatigue-free. The nine-inch screen, small by normal standards, actually improves visibility for me, since it can be taken in at a glance from any reasonable working distance. Larger screens require more scanning at normal distances, which contributes to eyestrain and fatigue.

I forgot about color after less than a day with the Mac; the variety and power of its built-in graphics more than compensate for color. While I am a fan of high-resolution color on other computers, I wouldn't want to give up even a tiny fraction of the Mac's sharpness and precise graphics for color.

SLIM AND TRIM

For all its power, the Macintosh is deceptively compact and lightweight. It takes up little space on a desktop, blending unobtrusively into any environment. The much larger and heavier IBM PC tends to dominate a desk, usually requiring a separate table to provide sufficient workspace.

Taking the Mac on the road is a snap. You can disassemble it and slip it into its padded case in less than

two minutes. A full system weighs nearly as much as a Compaq or Kaypro (about 22 pounds), but is smaller and easier to carry, especially with a shoulder strap. I routinely carry the machine home and back to work again. This enables me to expand my workday, and to explore new uses and programs away from the pressures and distractions of a busy office. I can draft a memo or refine a spreadsheet at my leisure, setting up the system on the coffee table, or even at a friend's house after dinner.

And the Macintosh travels much more gracefully on the road than most portables, fitting into airline overhead racks and garment bag closets that would be impossibly small for a larger machine.

At home, the Mac's small size, attractive appearance, and lack of cable clutter enable it to integrate into any room, including the kitchen. And the whole family can use it right away. I even got my wife to admit that it's fun to use, after five years of steadfastly resisting the assorted charms of a constant stream of equipment that has passed through our house.

The kids love it too—because they can use it without a lot of typing or reading. My son is a preschooler who loves to make computers "do stuff," but who gets frustrated with keyboarding and text-oriented menus. The Mac is a lot easier for him, though he still needs some help working the menus and choosing between icons that look alike.

SERIOUS SOFTWARE

It took a while to fill the pipeline, but a veritable flood of Macintosh software has hit the market, from games to dental-office management packages (see accompanying "Sampler"). Much of this software is, or seems, better than average. I attribute this to the fact that designers and programmers no longer have to create a user interface because Apple has already done that—with the *Finder* and the mouse. So software designers can spend more time making the program work, and eliminating annoying bugs and loose ends.

BIG GOODIES

Lotus' *Jazz* is here! After only a few days' use, you'll be convinced that it's a superb program. Many, if not most, Macintosh users could invest in this program alone, and have all the power and versatility they could ever ask from their computer. *Jazz*, an integrated program with spreadsheet, word processing, communications, graphing, and data-base functions, has most of the power and flexibility of *Symphony*, and is easier to learn and use than 1-2-3, Lotus' two big-selling programs for the IBM PC.

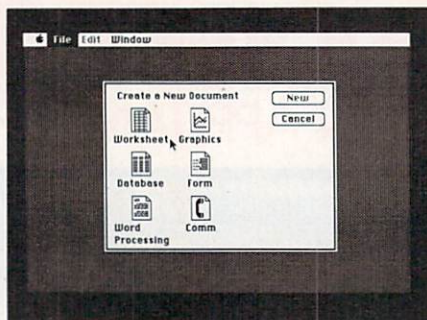
There are, of course, several excellent programs that can be used to go beyond the basic functions in *Jazz*. *Excel* (Microsoft) is designed for heavy spreadsheet users. *MacDraw* and *MacProject* (Apple) are unique and versatile. *MacDraw* is a graphics program that offers a considerable advance in power and precision over *MacPaint*. *MacProject* is a project- and resource-management tool that is an invaluable aid to anyone responsible for managing projects on a deadline, from a church bazaar to building a manufacturing facility.

Ready-Set-Go (Manhattan Graphics) and *Page Maker* (Aldus Corp.) both bring professional layout and typesetting capabilities to the Macintosh user, making it easy to create striking page compositions and presentation effects.

The second super-goodie (after *Jazz*) is *Switcher* (Apple), software that allows you to load up to four programs into a 512K Macintosh, and switch between them with a double-click of the mouse. (*Switcher* is scheduled for a late summer/fall release.) When you do this, the old application slides sideways, and the new one slides into place. Thus, a user who needs to use three or four full-featured programs in an integrated fashion (for example, communications to download data from an information service, a data-base or spreadsheet program to analyze that data, and a word processor or graphics program to produce a final report) can do so via *Switcher* with a minimum of waiting and disk-swapping.

LITTLE GOODIES

Along with major application programs, there is a growing pile of utility and accessory programs for the Macintosh. At the top and extreme left of nearly every Macintosh program is a symbol of an apple. Clicking the mouse on this symbol pulls down a menu of handy little tools that can be used right in the middle of any program. The standard *Macin-*



Icons on Lotus' *Jazz* (\$395) show the program's many functions.

tosh Desk Accessories program includes: a Notepad, for jotting quick notes and memos; a Scrapbook, for storing often-used graphics or text data; an Alarm Clock, to keep track of the time; a Calculator; and a Puzzle.

The exciting development is that third-party software companies are developing powerful desk accessories that will make it possible for many users to avoid buying full-scale applications to handle occasional needs. For example, T/Maker Graphics offers the *Click On Worksheet*, a small but powerful spreadsheet accessory that also includes light-duty graphics. For many people, this would eliminate the need for separate spreadsheet and graphing programs.

DRAWBACKS

No computer is perfect. The Macintosh has flaws. Apple is working on some right now, with solutions

scheduled for the near future. Others may never really be solved. For me, and I believe for most users, these problems are seldom more than annoyances, but they are real.

The worst problem, for me, is disk storage. Now, 400K on a floppy disk is pretty good; it's more than you can put on an IBM disk. But by the time you put the *System* and *Finder* files and a normal application program on the disk, there is very little room left.

A second disk drive is an absolute necessity for the serious Macintosh user (much more important than getting the extra memory of the Fat Mac), and a hard-disk drive is even better. But even with a second floppy, it is a constant battle to keep disks from getting uncomfortably full. This is especially true when you're using *Switcher* and you need to have three or four programs available at once.

Another problem is—or was—that using the Macintosh can be frustratingly slow. All the convenience features built into the *Finder* can actually get in the way of the user, particularly if he or she is shuttling back and forth between two programs. Apple's revised *Finder* and *Switcher* go most of the way toward solving this problem, since they make it much faster to change programs without having to return to the desktop.

Some people still feel that the lack of cursor keys is a drawback. I agree, partially, in that cursor keys can be handy when revising a spreadsheet or doing a lot of spelling corrections in word processing. Cursor keys are available on the numeric keypad, but few programs will recognize them (*Jazz*, *Multiplan*, and *Microsoft Word* will).

ALL TOGETHER

Any product can be nitpicked. The fact remains that after a year of development and an onslaught of software, the Macintosh is a superb computer for people who want to work on a computer. Everyone that I know who has actually used a Macintosh for any length of time, from novice to experienced professional, is completely hooked on the machine, and wants one. It requires so little effort, and is productive and fun to use. And all of us can use a little more fun in our working lives, whether at home or at the office.

The easier a computer is to operate, the more it will be used. The only way that one benefits from having a computer is to use it. Clearly, the Mac is the way of the future. Isn't it nice that it's here today?

MACINTOSH SOFTWARE

ALDUS CORP., (206) 467-8165; APPLE COMPUTER, (408) 996-1010; ARRAYS, INC./CONTINENTAL SOFTWARE, (213) 410-9466; ASSIMILATION, INC., (408) 446-0797; BRAINPOWER, INC., (818) 884-6911; BRODERBUND SOFTWARE, (415) 479-1170; COMPUTER SOFTWARE DESIGN, (714) 634-9012; DESKTOP SOFTWARE, (609) 924-7111; FORETHOUGHT, INC., (415) 961-4720; GREAT WAVE SOFTWARE, (415) 325-2202; HAYDEN SOFTWARE, (800) 343-1218; INFOCOM, (617) 492-6000; LIVING VIDEOTEXT, (415) 964-6300; LOTUS DEVELOPMENT CORP., (617) 577-8500; MAGNUM SOFTWARE, (818) 700-0510; MANHATTAN GRAPHICS CORP., (212) 989-6442; MARK OF THE UNICORN, (617) 576-2760; MICROSOFT CORP., (800) 426-9400; MIRAGE CONCEPTS, (209) 227-8369; ODESTA, (312) 498-5615; PALADIN SOFTWARE CORP., (408) 946-9000; PROVEE DEVELOPMENT CORP., (714) 969-2431; PROFESSIONAL SOFTWARE, INC., (617) 444-5224; PRIORITY SOFTWARE, (408) 757-0125; SCARBOROUGH SYSTEMS, (914) 332-4545; SIMON & SCHUSTER, (212) 245-6400; TELOS SOFTWARE PRODUCTS, (800) 554-2469; T/MAKER GRAPHICS, (415) 962-0195.

MAC SOFTWARE SAMPLER

BY SHARON ZARDETTO AKER

Macintosh software was scarce this time last year. Now, however, shelves overflow with a variety of packages that maximize the machine's superb graphics and friendliness. Users can execute newsletters, manage a small business' or disorganized household's files, and pay bills as well as, if not more effectively than with other computers and software. On top of that, teamed up with some of the best design-oriented packages, the Mac transforms into an animation studio, a dynamic, creative instrument, and more.

Few packages exist in the field of home education. But, as more families take advantage of the machine's productive potential, chances are you'll see more titles from the educational publishers.

WORD PROCESSING

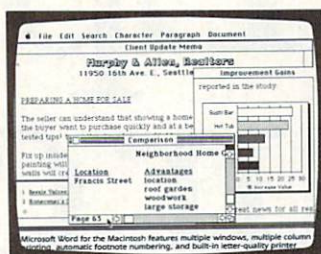
MacWrite and **MacPaint**, the word-processing and graphics programs bundled with the machine, set a software standard and showcase the computer's unique operating system. **MacWrite** remains the top choice for small-scale word-processing needs: term papers, letters, and reports. A new version, 4.5, available to Mac owners from Apple dealers at no extra cost, features useful improvements.

Word (Microsoft; 128K; \$195), the strongest professional word-processing package available, takes over where **MacWrite** leaves off. It can handle multi-column printing for newsletter-publishing, for example. Numerous direct command-key options mean you won't have to pull down a menu to save or adjust your work.

NUMBER CRUNCHERS

Multiplan (Microsoft; 128K; \$195). The leading Mac spreadsheet for home and most business use has all the basics and a user-friendliness that helps lessen the headache usually involved in the spreadsheet-design process.

Excel (Microsoft; 512K; \$395). With as many as 4 million cells at your disposal, this should take care of spreadsheeting needs of Pentagon proportions. Built-in graphics capabilities even let you add illustrative diagrams.



Microsoft's Word

Crunch (Paladin Software; 512K; \$295). This heavy-hitting package combines spreadsheet, graphics, and data-base management.

DATA BASES

I Know It's Here Somewhere... (Hayden Software; 128K; \$99.95). An ideal package for household and personal filing needs eases file design and data entry.

FileMaker (Forethought; 128K; \$195). On top of handling numerical and text data, you can file pictures and illustrations in this data base.

File (Microsoft; 128K; \$195). Created to work with **Word**, this data-base manager stands on its own merits, handling pictorial data as well as it does text data.

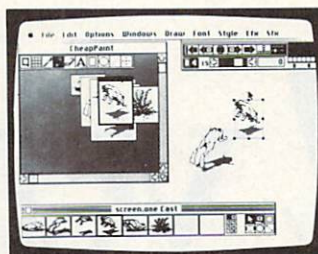
GAMES

Lode Runner (Broderbund; 128K; \$39.95). Easily the most addictive game around, the Mac version of Broderbund's best-seller gives you 150 screens to climb, jump, and race through as you attempt to gather gold before the bad guys catch up with you.

Zork, et al. (Infocom; 128K; \$39.95-\$44.95). The entire Infocom line of text adventures has come out for the Mac. Choose from the science-fiction, fantasy, or whodunit themes at three skill levels.

Forbidden Quest (Priority Software; 128K; \$44.95). Alone on an abandoned space vehicle, you must land on a planet and locate the ancient wisdom that will allow you to save the galaxy. A text adventure with a sprinkling of graphics, this game, and **Gateway** (Priority Software; 128K; \$49.95), in which you inherit a deserted building and find the gateway to other worlds, compete with the best of Infocom offerings.

Cyborg (Broderbund; 128K; \$39.95). Half-human, half-robot, you have a mission, but



Hayden's Videoworks

first you must figure out what it is.

Sargon III (Hayden Software; 128K; \$49.95). Making one of the best uses of the mouse and Mac graphics, this program features numerous play options (take back a move, review the game, switch sides, adjust difficulty levels).

Trivia Fever (Professional Software; 128K; \$39.95). With questions at all levels of difficulty, this package lets you set handicaps so you won't always cream your kids, or vice versa.

Trivia (Mirage Concepts; 128K; \$24.95). Not only can you purchase additional question disks for this trivia package, you can even make up your own questions.

CREATIVITY

Click Art Special Effects (T/Maker Graphics; 128K; \$49.95) lets you rotate and tilt images created with **MacPaint** a degree at a time, view them from perspective, slant, and distort them to any degree.

Slide Show Magician (Magnum Software; 128K/512K; \$59.95). Set up a slide show composed of **MacPaint** pictures. Use the special effects which allow you to flip through pictures, even add buttons and drawing pointers to the presentation.

VideoWorks (Hayden Software; 128K; \$99). This package gives you two methods for creating animation on the Mac. Its applications range from animated business presentations, to purely creative exploration.

ConcertWare (Great Wave Software; 128K; \$49.95). Enter and play back music, using preset sounds or ones you've designed. Use the keyboard or mouse to enter notes from sheet music and play back as accompaniment.

Professional Composer (Mark of the Unicorn; 512K; \$495). This package covers all the composition and transcription bases. Pros can use virtually all

known musical symbols to print out music.

RANDOM ACCESSORIES

Home Accountant and Financial Planner (Arrays; 128K; \$150, external disk drive required). Maintain checkbook, tax records, and 200 budget categories in package that reminds you of regularly scheduled mortgage payments or other bills, and includes future value/present value calculations.

ThinkTank (Living Videotext; 128K-512K; \$145-\$245). This powerful outline processor, or thought organizer, lets you arrange and rearrange ideas.

Art Grabber (Hayden Software; 128K; \$49.95) will come in handy for regular Mac painters who use pictures in other applications. It saves time and steps in that it lets you place a **MacPaint** picture in the middle of another program.

ALSO NOTEWORTHY

Be sure to take a look at the font disks around. They let you add more personalized typefaces and variety to your documents. Art disks consist of pre-drawn images that the less-artistically inclined can use in conjunction with **MacPaint**. **The Mac Art Dept.** (Simon & Schuster; 128K; \$39.95) boasts an assortment of buildings, boats, bodies, and more. **Home Design** (Hayden; 128K; \$79.95) furnishes more than 800 detailed images of design details.

Also keep your eyes open for these new releases.

Deluxe Music Construction Set (Electronic Arts; 128K; \$50). A barely recognizable, souped-up version of the Apple and Commodore music package.

Deja Vu (Mindscape; 128K; \$54.95). You wake up injured and discover a murder. You're the prime suspect, unless you can prove otherwise.

The Great International Paper Airplane Construction Kit (Simon & Schuster; 128K; \$39.95). Design and print out, with perforations and decorations, an assortment of paper airplanes.

Ultima II (Sierra; 128K; \$59). Fantasy/role-playing adventure in which you journey into a world riddled with treasures and traps. **FC**

SHARON ZARDETTO AKER, a frequent FAMILY COMPUTING contributor, is just mad about the Mac.

Epson *all* your conc

You have
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Now you want
a printer.

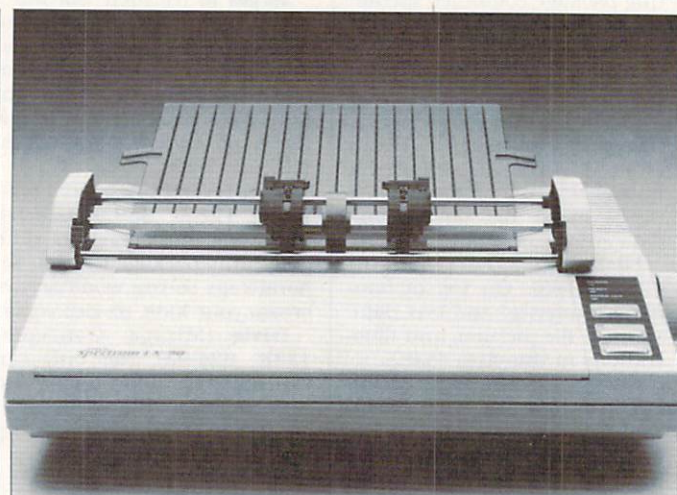
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compatibility?

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*While most other printers only offer
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owning an Epson that very few people ever have the
opportunity to take advantage of.*

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the printers they sell with
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world. And the reason is this. Day
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have been working longer than
most of our competitors have
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You know you need a printer
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spend your good money, you
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p's on your monitor come out as
q's on your printer.

But Epson printers are the
standard to which virtually all
major computer software is written.
So whether you have an IBM® PC
or the newest name on the market,
there are Epson printers for vir-
tually any hardware/software
combination.

answers erns in print.

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For almost any computer. With the Epson Spectrum™ LX-80 printer, and interface cable, you can work with almost any computer. Most often used with the Apple II® and IBM PC, it prints out 100 characters per second in draft mode. And 16 characters per

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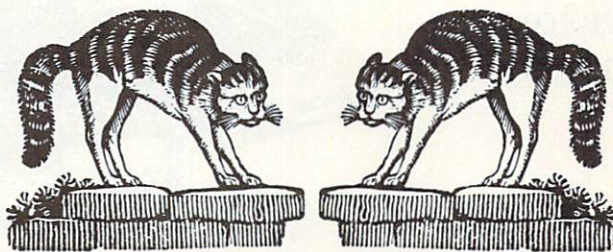
"So the question is:
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button typestyle control and excellent graphic capabilities, it offers a lot of performance for not a lot of money. Available through Epson authorized computer specialty stores.

For the Apple II® and IBM® PCjr. The Epson Spectrum™ LX-90 is the perfect match for the Apple IIc and IBM PCjr. Also printing 100 characters per second, draft, and 16 char-

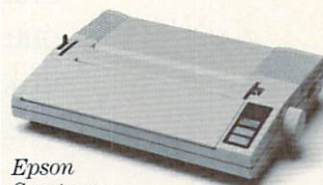
acters per second in Near Letter Quality mode, the Spectrum LX-90 features friction and tractor feeds for both plain paper and continuous form computer paper. This makes it better for business applications. It uses a Printer Interface Cartridge (PIC™) to assure maximum compatibility with your computer.

Epson dot matrix printers have very graphic advantages. Besides the versatility of draft and Near Letter Quality and the corresponding speed options, they can draw some very convincing pictures, including true circles.

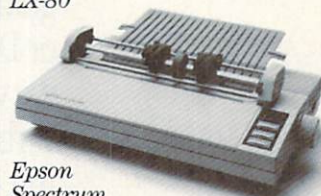


Recently in Martinez, California, two cats knocked an Epson printer 4 feet onto a tile/concrete floor. Although it didn't land on its feet, the printer is still running.

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such a rugged yet so fan-
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L.F.G., Martinez, CA

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industry often faulted by
products designed to
last about ninety days."**
John Cameron,
Medical Director,
Raleigh Hills Hospital

**"I have had my Epson
about six weeks... my
only regret is that I didn't
replace my old printer a
year ago."**
L.A.R., 29 Palms, CA

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the Programmer

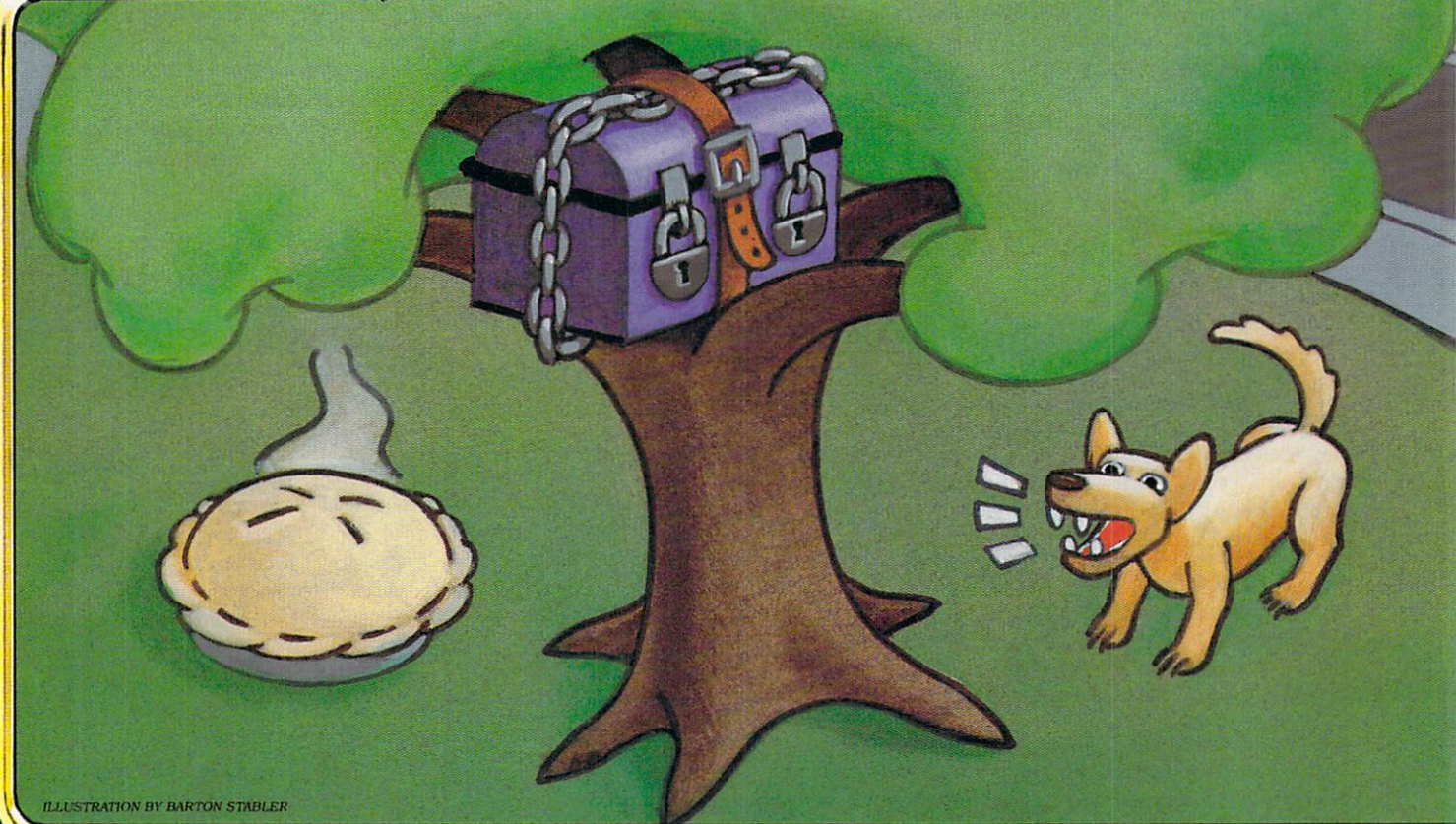


ILLUSTRATION BY BARTON STABLER

S E P T E M B E R

TIPS TO THE TYPIST

Page 54

How to type in FAMILY COMPUTING's programs.

BEGINNER PROGRAM

Page 56

Terminal Tale can tell a million stories. One of them is just for you!

CREATIVITY PROGRAM

Page 64

Let *Draw & Print* harness your printer to your imagination.

PUZZLE

Page 72

Help Mrs. Weiss guess wisely and crack little Ehrich's caper.

PROGRAMMING P.S. Page 78 Corrections to previous months' programs.

ILLUSTRATION BY JIM CHERRY III

Cherry

TIPS TO THE TYPIST

Typing in FAMILY COMPUTING'S programs is a great way to become familiar with your computer and get some free software "to boot." But it's frustrating to type in a long program only to find it doesn't work as it should. When this happens, simple typing errors are most often the cause. So to help you gain greatest value from the time you spend computing with us, we've put together some tips on how to avoid typing errors—and what to do if a program doesn't run right. Read them carefully and you'll be up and running in no time!

SOME GENERAL RULES

1. Do read instructions and program headings carefully. Make sure your computer has enough memory, the right version of BASIC, and the appropriate peripherals (joysticks, printers, disk drives, etc.) for a program.

2. Don't let fatigue and boredom contribute to inaccuracy. If you're new to programming, try typing in shorter programs first. Type in a longer program in easy stages, saving each installment as you go.

3. Until you are fairly familiar with BASIC, **do** assume that every word, number, letter, space, and punctuation mark in a program listing must be copied accurately if the program is to function as intended.

4. Do watch out for potential trouble spots. About 90 percent of all typing errors occur in DATA statements: long lines filled with numbers or incomprehensible secret codes. If possible, have someone else read DATA to you as you type, and help you proofread it if you have trouble later on. Proofreading from a printout is best.

5. Do be aware that program listings printed in FAMILY COMPUTING sometimes differ from what you will see on your computer's screen or in printouts you produce at home. Our program listings are printed 54 characters wide. Thus, a single BASIC program "line" (sometimes called a "logical line") may appear as several lines in our listing. If you are typing along and reach the right margin of the printed listing, don't press RETURN or ENTER until you've checked to see if the program "line" you're typing really ends there. The way to tell is to check if the line following begins with a multiple of 10 that follows in sequence from the previous logical line. REM statements are the exception and typing them in is optional.

Several computers (ADAM, Apple, Atari, and TI) format BASIC programs according to unique rules of their own. Don't let this throw you—just type in the listing exactly as printed in the magazine and your computer is guaranteed to accept it, even though it may end up looking a little different on your screen.

6. One foolproof way to correct an error in a BASIC program line is to type the line in again from the beginning, and press RETURN or ENTER to set it in place of the old one in your computer's memory.

WHICH PROGRAMS WILL RUN ON MY COMPUTER?

Unless a program heading indicates otherwise, programs

will run on any version of the computer specified, with the following exceptions:

- Apple programs run under Applesoft (not Integer) BASIC on the Apple II (with language card), II plus, IIe, and IIc. The Macintosh is not supported as of this writing.
- IBM compatibility of BASIC programs is determined by both the hardware and the version of BASIC used. Our programs for IBM PC & compatibles are composed on IBM PC & PCjr's, and tested under most versions of BASIC available for these machines. They are then tested on a variety of IBM-compatible machines under the versions of BASIC supplied with them. Each "IBM PC & compatibles" program listing is supplemented by a rundown of the machines and versions of BASIC under which the program is guaranteed to work. Most programs will probably run on many other PC Compatibles and under other versions of BASIC.
- TI programs not marked "w/TI Extended BASIC" should be run under standard (console) TI BASIC.

DEBUGGING HINTS

Sometimes even the most careful typist makes a mistake. Don't expect your program to run right off the bat. If you have problems, remain patient and follow these general instructions for a probable quick fix.

LIST the program in screen-size chunks (check your manual for instructions on how to LIST parts of a program). Even better, if you have a printer, get a printout. Compare what you've typed in—letter by letter—to the published program. Make sure that you haven't typed the numeral 0 (which is slashed in our listings) for the letter O (which isn't), swapped a small letter "l" for the numeral one, dropped or mixed up some punctuation, switched uppercase text for lowercase or vice versa (particularly in DATA statements or within quotes), or miscounted the characters (and/or spaces) between a pair of quotes. Get someone to help you if possible.

Check your DATA statements—then check them again. Mistakes in DATA statements are the single most common cause of program failures. Bad DATA can cause a program to malfunction at any point, which can be misleading.

WHAT TO DO WHEN YOU'VE DONE IT ALL

We're proud of our programs, and we want you to enjoy them as much as we enjoy writing them. If you just can't figure out what's wrong with a program, we'd like to help. But we can't if you don't provide us with important information. When you write us (no telephone calls, please), indicate:

- Which program you're having trouble with.
- Which type of computer you own, the type of BASIC you are using, how much RAM your computer has, and what DOS and peripherals you're using, if any.
- What error messages your computer has given you.
- Your name, address, and telephone number.

If possible, please enclose a printout. Address all correspondence to Programming P.S., FAMILY COMPUTING, 730 Broadway, New York, NY 10003.

A TERMINAL TALE



BY JOEY LATIMER

One day, back when I was in junior high school, a girl nicknamed "Mouse" walked up to me. She was carrying a piece of notebook paper, and she started asking me a whole bunch of personal questions: "What's your favorite color?" "Who do you love?" "Do you wear pajamas?"

"Wait a minute! What's all this for?" I asked.

"It's for a class," she said. Being a good sport, I answered all the questions, and Mouse started tallying the results. To my surprise, several of Mouse's girlfriends suddenly gathered around, and she began reading what seemed to be an old-fashioned story. But wait! I was the star! I had green hair, and I was going on a honeymoon in a '56 Chevy with my next-door neighbor!

What Mouse had done (besides embarrassing me) was insert the information I had given her into a story she had already written on the notebook paper. This type of story is called a "fill-in" story—one in which people's names, places, and other details are filled in after the story is written, to make a very personal (sometimes too personal) product.

This month's beginner program is a simple fill-in story called *A Terminal Tale*. The computer asks you some innocent-sounding questions, then takes the answers you supply and threads them together into a rather unlikely scenario. Have fun!

PROGRAM NOTES

Terminal Tale uses a combination of PRINT and INPUT statements to ask questions and place the user's responses in a group of string variables. These strings are then inserted into PRINT statements, in combination with other words, phrases, and punctuation, to make a story.

When a string variable is used as part of a PRINT statement, it is usually bracketed by semicolons, like this:

```
10 PRINT "MY NAME IS ";NS;"."
```

The semicolons tell the computer to print everything in the PRINT statement, including the contents of the string variable, together on the same screen line.

It's not hard to make up your own fill-in story, or modify ours to suit your taste. Those of you with printers may want to experiment to see if you can print a hard copy of our *Terminal Tale*.

As always, if you come up with an interesting modification or enhancement of one of our beginner programs, we'd like to see it, and maybe mention it in a future issue. Please send a printout (no tapes or disks) to Beginner Programs, FAMILY COMPUTING, 730 Broadway, New York, NY 10003.

On that note, we'd like to thank Phyllis Margarites of Burbank, Illinois for sending in a wonderful Atari version of the *Backward Speller*.

ADAM & Apple/Terminal Tale

```
10 HOME
20 PRINT "PLEASE PRESS <RETURN> AFTER"
30 PRINT "ANSWERING EACH QUESTION."
40 PRINT
50 INPUT "WHAT'S YOUR NAME? ";NS
60 INPUT "ARE YOU FEMALE OR MALE? ";SS
70 IF LEFT$(SS,1) = CHR$(102) OR LEFT$(SS,1) = "F" THEN
  NS = "SHE":GOTO 90
80 GS="HE"
90 PRINT "WHAT CITY OR TOWN ARE"
100 INPUT "YOU FROM? ";CS
110 PRINT "WHAT'S YOUR FAVORITE TINY"
120 INPUT "ANIMAL (E.G., MOUSE)? ";AS
130 INPUT "WHO REALLY BUGS YOU? ";BS
140 INPUT "WHO DO YOU HAVE A CRUSH ON? ";LS
150 PRINT "WHAT'S YOUR LEAST FAVORITE"
160 INPUT "FOOD? ";FS
170 HOME
180 PRINT TAB(3);"*A TERMINAL TALE OF ";NS;"*"
190 PRINT
200 PRINT "ONCE UPON A TIME, IN THE"
210 PRINT "CITY OF ";CS;", THERE LIVED"
220 PRINT "A BRAVE SOUL NAMED ";NS;". "
230 PRINT "ONE DAY, AS ";NS;" WAS"
240 PRINT "OUT RIDING A WILD ";AS;","
250 PRINT GS;" HEARD THE NEARBY SCREAMS"
260 PRINT "OF ";LS;". UPON ARRIVING AT"
270 PRINT "THE SCENE, ";GS;" FOUND"
280 PRINT LS;" UP IN A TREE,"
290 PRINT "MENACED BY A BARKING DOG,"
300 PRINT "NAMED ";BS;"," DOWN BELOW."
310 PRINT
320 PRINT "(PRESS ANY KEY TO CONTINUE.)"
330 GET K$
340 HOME
350 PRINT "THINKING FAST, ";NS
360 PRINT "RAN INTO A NEARBY PIE SHOP,"
370 PRINT "BOUGHT A FRESH ";FS
380 PRINT "PIE, AND FED IT TO ";BS;","
390 PRINT "WHO LOVED IT!"
400 PRINT "THEN, ";NS;" HELPED"
410 PRINT LS;" DOWN FROM THE TREE."
420 PRINT "THEY RODE OFF ON THE ";AS
430 PRINT "AND LIVED HAPPILY EVER AFTER."
440 PRINT "(",BS;" WENT ON TO MAKE IT"
450 PRINT "BIG IN PET FOOD COMMERCIALS.)"
460 PRINT
470 PRINT TAB(10);"*THE END*"
```

Atari 400, 800, 600/800XL, & 130XE/Terminal Tale

```
10 PRINT CHR$(125);
20 OPEN #1,4,0,"K:"
30 DIM NS(20),SS(1),GS(3),CS(20),AS(20),BS(20),LS(20),
  FS(20)
40 PRINT "PLEASE PRESS <RETURN> AFTER"
50 PRINT "ANSWERING EACH QUESTION."
60 PRINT
70 PRINT "WHAT'S YOUR NAME";
80 INPUT NS
90 PRINT "ARE YOU FEMALE OR MALE";
100 INPUT SS
110 IF SS="F" THEN GS="SHE":GOTO 130
120 GS="HE"
130 PRINT "WHAT CITY OR TOWN ARE YOU FROM";
140 INPUT CS
150 PRINT "WHAT'S YOUR FAVORITE TINY ANIMAL"
160 PRINT "(E.G., MOUSE)";
170 INPUT AS
180 PRINT "WHO REALLY BUGS YOU";
190 INPUT BS
200 PRINT "WHO DO YOU HAVE A CRUSH ON";
210 INPUT LS
220 PRINT "WHAT'S YOUR LEAST FAVORITE FOOD";
230 INPUT FS
```


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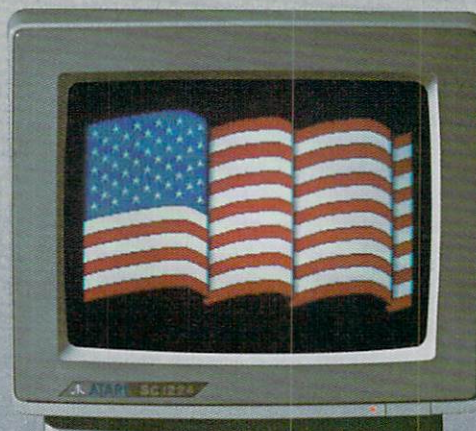
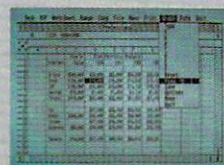
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BEGINNER PROGRAM

```

240 PRINT CHR$(125);
250 PRINT "      *A TERMINAL TALE OF ";NS;"*"
260 PRINT
270 PRINT "      ONCE UPON A TIME, IN THE"
280 PRINT "CITY OF ";CS;"", THERE LIVED A"
290 PRINT "BRAVE SOUL NAMED ";NS;". ONE"
300 PRINT "DAY, AS ";NS;" WAS OUT RIDING"
310 PRINT "A WILD ";AS;"", ";GS;" HEARD THE"
320 PRINT "NEARBY SCREAMS OF ";LS;". "
330 PRINT "UPON ARRIVING AT THE SCENE,"
340 PRINT GS;" FOUND ";LS;" UP IN A TREE,"
350 PRINT "MENACED BY A BARKING DOG, NAMED"
360 PRINT BS;"", DOWN BELOW."
370 PRINT
380 PRINT "(PRESS ANY KEY TO CONTINUE.)"
390 GET #1,K
400 PRINT CHR$(125);
410 PRINT "      THINKING FAST, ";NS;" RAN INTO"
420 PRINT "A NEARBY PIE SHOP, BOUGHT A"
430 PRINT "FRESH ";FS;" PIE, AND FED IT"
440 PRINT "TO ";BS;"", WHO LOVED IT!"
450 PRINT "      THEN, ";NS;" HELPED"
460 PRINT LS;" DOWN FROM THE TREE."
470 PRINT "THEY RODE OFF ON THE ";AS
480 PRINT "AND LIVED HAPPILY EVER AFTER."
490 PRINT "(",BS;" WENT ON TO MAKE IT BIG"
500 PRINT "IN PET FOOD COMMERCIALS.)"
510 PRINT
520 PRINT "      *THE END*"

```

Commodore 64 & 128 (C 64 mode)/Terminal Tale

```

10 PRINT CHR$(147);
20 PRINT "PLEASE PRESS <RETURN> AFTER"
30 PRINT "ANSWERING EACH QUESTION."
40 PRINT
50 INPUT "WHAT'S YOUR NAME";NS
60 INPUT "ARE YOU FEMALE OR MALE";SS
70 IF LEFT$(SS,1)="F" THEN GS="SHE":GOTO 90
80 GS="HE"
90 INPUT "WHAT CITY OR TOWN ARE YOU FROM";CS
100 PRINT "WHAT'S YOUR FAVORITE TINY ANIMAL"
110 INPUT "(E.G., MOUSE)";AS
120 INPUT "WHO REALLY BUGS YOU";BS
130 INPUT "WHO DO YOU HAVE A CRUSH ON";LS
140 INPUT "WHAT'S YOUR LEAST FAVORITE FOOD";FS
150 PRINT CHR$(147);
160 PRINT TAB(3);"*A TERMINAL TALE OF ";NS;"*"
170 PRINT
180 PRINT "      ONCE UPON A TIME, IN THE"
190 PRINT "CITY OF ";CS;"", THERE LIVED A"
200 PRINT "BRAVE SOUL NAMED ";NS;". ONE"
210 PRINT "DAY, AS ";NS;" WAS OUT RIDING"
220 PRINT "A WILD ";AS;"", ";GS;" HEARD THE"
230 PRINT "NEARBY SCREAMS OF ";LS;". "
240 PRINT "UPON ARRIVING AT THE SCENE,"
250 PRINT GS;" FOUND ";LS;" UP IN A TREE,"
260 PRINT "MENACED BY A BARKING DOG, NAMED"
270 PRINT BS;"", DOWN BELOW."
280 PRINT
290 PRINT "(PRESS ANY KEY TO CONTINUE.)"
300 GET K$
310 IF K$="" THEN 300
320 PRINT CHR$(147);
330 PRINT "      THINKING FAST, ";NS;" RAN INTO"
340 PRINT "A NEARBY PIE SHOP, BOUGHT A"
350 PRINT "FRESH ";FS;" PIE, AND FED IT"
360 PRINT "TO ";BS;"", WHO LOVED IT!"
370 PRINT "      THEN, ";NS;" HELPED"
380 PRINT LS;" DOWN FROM THE TREE."
390 PRINT "THEY RODE OFF ON THE ";AS
400 PRINT "AND LIVED HAPPILY EVER AFTER."
410 PRINT "(",BS;" WENT ON TO MAKE IT BIG"
420 PRINT "IN PET FOOD COMMERCIALS.)"
430 PRINT
440 PRINT TAB(10);"*THE END*"

```

IBM PC & compatibles*/Terminal Tale

```

10 KEY OFF
20 CLS
30 PRINT "Please press <ENTER> after"
40 PRINT "answering each question."
50 PRINT
60 INPUT "What's your name";NS
70 INPUT "Are you female or male";SS
80 IF LEFT$(SS,1)="F" OR LEFT$(SS,1)="f" THEN GS="she"
   ELSE GS="he"
90 INPUT "What city or town are you from";CS
100 PRINT "What's your favorite tiny animal"
110 INPUT "(e.g., mouse)";AS
120 INPUT "Who really bugs you";BS
130 INPUT "Who do you have a crush on";LS
140 INPUT "What's your least favorite food";FS
150 CLS
160 PRINT TAB(5);"*A Terminal Tale of ";NS;"*"
170 PRINT
180 PRINT "      Once upon a time, in the"
190 PRINT "city of ";CS;"", there lived a"
200 PRINT "brave soul named ";NS;". One"
210 PRINT "day, as ";NS;" was out riding"
220 PRINT "a wild ";AS;"", ";GS;" heard the"
230 PRINT "nearby screams of ";LS;". "
240 PRINT "Upon arriving at the scene,"
250 PRINT GS;" found ";LS;" up in a tree,"
260 PRINT "menaced by a barking dog, named"
270 PRINT BS;"", down below."
280 PRINT
290 PRINT "(Press any key to continue.)"
300 IF INKEY$="" THEN 300 ELSE CLS
310 PRINT "      Thinking fast, ";NS;" ran into"
320 PRINT "a nearby pie shop, bought a"
330 PRINT "fresh ";FS;" pie, and fed it"
340 PRINT "to ";BS;"", who loved it!"
350 PRINT "      Then, ";NS;" helped"
360 PRINT LS;" down from the tree."
370 PRINT "They rode off on the ";AS
380 PRINT "and lived happily ever after."
390 PRINT "(",BS;" went on to make it big"
400 PRINT "in pet food commercials."
410 PRINT
420 PRINT TAB(15);"*THE END*"

```

*This program has been tested on the following computers, using the BASICs shown: IBM PC w/Color Graphics Adapter or Monochrome/Printer card, w/Disk BASIC D2.00 or Advanced BASIC A2.00.
IBM PCjr. w/Cassette BASIC C1.20 and Cartridge BASIC J1.00. Tandy 1000. w/GW-BASIC 2.02 versions 00.05.00 & 01.01.00.

TI-99/4A/Terminal Tale

```

10 CALL CLEAR
20 PRINT "PLEASE PRESS <ENTER> AFTER"
30 PRINT "ANSWERING EACH QUESTION."
40 PRINT
50 INPUT "WHAT'S YOUR NAME?";NS
60 INPUT "ARE YOU FEMALE OR MALE?";SS
70 IF (SEG$(SS,1,1)="F")+(SEG$(SS,1,1)="f") THEN 100
80 GS="HE"
90 GOTO 110
100 GS="SHE"
110 PRINT "WHAT CITY OR TOWN ARE YOU"
120 INPUT "FROM?";CS
130 PRINT "WHAT'S YOUR FAVORITE TINY"
140 INPUT "ANIMAL (E.G., MOUSE)?";AS
150 INPUT "WHO REALLY BUGS YOU?";BS
160 PRINT "WHO DO YOU HAVE"
170 INPUT "A CRUSH ON?";LS
180 PRINT "WHAT'S YOUR LEAST FAVORITE"
190 INPUT "FOOD?";FS
200 CALL CLEAR
210 PRINT "*A TERMINAL TALE OF ";NS;"*"
220 PRINT
230 PRINT "      ONCE UPON A TIME, IN"

```




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Alphacom 40 Column Printer Thermal technology - does graphics. (Add \$7.50 Shipping) Alphacom C-64 or Atari Interface \$8.95.	\$99 ⁰⁰	\$24 ⁹⁵	\$22⁹⁵
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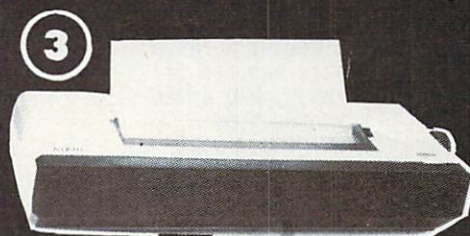
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BEGINNER PROGRAM

```

240 PRINT "THE CITY OF ";C$;" "
250 PRINT "THERE LIVED A BRAVE SOUL"
260 PRINT "NAMED ";N$;" ONE"
270 PRINT "DAY, AS ";N$;" WAS"
280 PRINT "OUT RIDING A WILD"
290 PRINT A$;" ", ";G$;" HEARD THE"
300 PRINT "NEARBY SCREAMS OF ";L$;" "
310 PRINT "UPON ARRIVING AT THE SCENE,"
320 PRINT G$;" FOUND ";L$
330 PRINT "UP IN A TREE, MENACED"
340 PRINT "BY A BARKING DOG, NAMED"
350 PRINT B$;" ", DOWN BELOW."
360 PRINT
370 PRINT "(PRESS ANY KEY TO CONTINUE.)"
380 CALL KEY(3,K,S)
390 IF S=0 THEN 380
400 CALL CLEAR
410 PRINT "      THINKING FAST, ";N$
420 PRINT "RAN INTO A NEARBY PIE"
430 PRINT "SHOP, BOUGHT A FRESH"
440 PRINT F$;" PIE, AND FED IT"
450 PRINT "TO ";B$;" ", WHO LOVED IT!"
460 PRINT "      THEN, ";N$
470 PRINT "HELPED ";L$;" DOWN"
480 PRINT "FROM THE TREE. THEY RODE"
490 PRINT "OFF ON THE ";A$;" AND"
500 PRINT "LIVED HAPPILY EVER AFTER."
510 PRINT "(",B$;" WENT ON TO MAKE"
520 PRINT "IT BIG IN PET FOOD"
530 PRINT "COMMERCIALS.)"
540 PRINT
550 PRINT TAB(11);"*THE END*"

```

TRS-80 Color Computer/Terminal Tale

```

10 CLS
20 CLEAR 1000
30 PRINT "PLEASE PRESS <ENTER> AFTER"
40 PRINT "ANSWERING EACH QUESTION."
50 PRINT
60 INPUT "WHAT'S YOUR NAME";N$
70 INPUT "ARE YOU FEMALE OR MALE";S$
80 IF LEFT$(S$,1)="F" THEN G$="SHE" ELSE G$="HE"
90 PRINT "WHAT CITY OR TOWN"
100 INPUT "ARE YOU FROM";C$
110 PRINT "WHAT'S YOUR FAVORITE TINY ANIMAL";
120 INPUT "(E.G., MOUSE)";A$
130 INPUT "WHO REALLY BUGS YOU";B$
140 PRINT "WHO DO YOU HAVE"
150 INPUT "A CRUSH ON";L$
160 PRINT "WHAT'S YOUR LEAST"
170 INPUT "FAVORITE FOOD";F$
180 CLS
190 PRINT "*A TERMINAL TALE OF ";N$;"*"
200 PRINT
210 PRINT "      ONCE UPON A TIME, IN THE"
220 PRINT "CITY OF ";C$;" ", THERE"
230 PRINT "LIVED A BRAVE SOUL NAMED"
240 PRINT N$;" ". ONE DAY, AS "
250 PRINT N$;" WAS OUT RIDING A WILD"
260 PRINT A$;" ", ";G$;" HEARD THE"
270 PRINT "NEARBY SCREAMS OF ";L$;" "
280 PRINT "UPON ARRIVING AT THE SCENE,"
290 PRINT G$;" FOUND ";L$;" UP IN"
300 PRINT "A TREE, MENACED BY A BARKING"
310 PRINT "DOG NAMED ";B$;" ", DOWN"
320 PRINT "BELOW."
330 PRINT
340 PRINT "(PRESS ANY KEY TO CONTINUE.)";
350 IF INKEY$="" THEN 350 ELSE CLS
360 PRINT "      THINKING FAST, ";N$
370 PRINT "RAN INTO A NEARBY PIE SHOP,"
380 PRINT "BOUGHT A FRESH ";F$;" PIE,"
390 PRINT "AND FED IT TO ";B$;" ", WHO"
400 PRINT "LOVED IT!"

```

```

410 PRINT "      THEN, ";N$;" HELPED"
420 PRINT L$;" DOWN FROM THE TREE."
430 PRINT "THEY RODE OFF ON THE ";A$
440 PRINT "AND LIVED HAPPILY EVER AFTER."
450 PRINT "(",B$;" WENT ON TO"
460 PRINT "MAKE IT BIG IN PET FOOD"
470 PRINT "COMMERCIALS.)"
480 PRINT
490 PRINT TAB(11);"*THE END*"

```

TRS-80 Model III & Model 4 w/Model III BASIC/ Terminal Tale

```

10 CLS
20 CLEAR 1000
30 PRINT "PLEASE PRESS <ENTER> AFTER"
40 PRINT "ANSWERING EACH QUESTION."
50 PRINT
60 INPUT "WHAT'S YOUR NAME";N$
70 INPUT "ARE YOU FEMALE OR MALE";S$
80 IF LEFT$(S$,1)="F" OR LEFT$(S$,1)="f" THEN G$="SHE"
   ELSE G$="HE"
90 INPUT "WHAT CITY OR TOWN ARE YOU FROM";C$
100 PRINT "WHAT'S YOUR FAVORITE TINY ANIMAL"
110 INPUT "(E.G., MOUSE)";A$
120 INPUT "WHO REALLY BUGS YOU";B$
130 INPUT "WHO DO YOU HAVE A CRUSH ON";L$
140 INPUT "WHAT'S YOUR LEAST FAVORITE FOOD";F$
150 CLS
160 PRINT TAB(5);"*A TERMINAL TALE OF ";N$;"*"
170 PRINT
180 PRINT "      ONCE UPON A TIME, IN THE"
190 PRINT "CITY OF ";C$;" ", THERE LIVED A"
200 PRINT "BRAVE SOUL NAMED ";N$;" ONE"
210 PRINT "DAY, AS ";N$;" WAS OUT RIDING"
220 PRINT "A WILD ";A$;" ", ";G$;" HEARD THE"
230 PRINT "NEARBY SCREAMS OF ";L$;" "
240 PRINT "UPON ARRIVING AT THE SCENE,"
250 PRINT G$;" FOUND ";L$;" UP IN A TREE,"
260 PRINT "MENACED BY A BARKING DOG, NAMED"
270 PRINT B$;" ", DOWN BELOW."
280 PRINT
290 PRINT "(PRESS ANY KEY TO CONTINUE.)"
300 IF INKEY$="" THEN 300 ELSE CLS
310 PRINT "      THINKING FAST, ";N$;" RAN INTO"
320 PRINT "A NEARBY PIE SHOP, BOUGHT A"
330 PRINT "FRESH ";F$;" PIE, AND FED IT"
340 PRINT "TO ";B$;" ", WHO LOVED IT!"
350 PRINT "      THEN, ";N$;" HELPED"
360 PRINT L$;" DOWN FROM THE TREE."
370 PRINT "THEY RODE OFF ON THE ";A$
380 PRINT "AND LIVED HAPPILY EVER AFTER."
390 PRINT "(",B$;" WENT ON TO MAKE IT BIG"
400 PRINT "IN PET FOOD COMMERCIALS.)"
410 PRINT
420 PRINT TAB(8);"*THE END*"

```

VIC-20/Terminal Tale

```

10 PRINT CHR$(147);
20 PRINT "PLEASE PRESS <RETURN>"
30 PRINT "AFTER ANSWERING EACH"
40 PRINT "QUESTION."
50 PRINT
60 PRINT "WHAT'S YOUR"
70 INPUT "NAME";N$
80 PRINT "ARE YOU FEMALE"
90 INPUT "OR MALE";S$
100 IF LEFT$(S$,1)="F" THEN G$="SHE":GOTO 120
   G$="HE"
110 G$="HE"
120 PRINT "WHAT CITY OR TOWN ARE"
130 INPUT "YOU FROM";C$
140 PRINT "WHAT'S YOUR FAVORITE"
150 PRINT "TINY ANIMAL"

```


BEGINNER PROGRAM

```

160 INPUT "(E.G., MOUSE)";A$
170 PRINT "WHO REALLY BUGS"
180 INPUT "YOU";B$
190 PRINT "WHO DO YOU HAVE A"
200 INPUT "CRUSH ON";L$
210 PRINT "WHAT'S YOUR LEAST"
220 INPUT "FAVORITE FOOD";F$
230 PRINT CHR$(147);
240 PRINT TAB(2);"*A TERMINAL TALE*"
250 PRINT TAB(6);"*OF ";N$;"*"
260 PRINT
270 PRINT "    ONCE UPON A TIME,"
280 PRINT "IN THE CITY OF ";C$;"",
290 PRINT "THERE LIVED A BRAVE"
300 PRINT "SOUL NAMED ";N$;"."
310 PRINT "ONE DAY, AS ";N$
320 PRINT "WAS OUT RIDING A"
330 PRINT "WILD ";A$;"", ";G$
340 PRINT "HEARD THE NEARBY"
350 PRINT "SCREAMS OF ";L$;"."
360 PRINT "UPON ARRIVING AT THE"
370 PRINT "SCENE, ";G$;" FOUND"
380 PRINT L$;" UP IN A TREE,"
390 PRINT "MENACED BY A BARKING"
400 PRINT "DOG, NAMED ";B$;"",
410 PRINT "DOWN BELOW."
420 PRINT
430 PRINT "(PRESS ANY KEY.)"
440 GET K$
450 IF K$="" THEN 440
460 PRINT CHR$(147);
470 PRINT "    THINKING FAST,"
480 PRINT N$;" RAN INTO A"
490 PRINT "NEARBY PIE SHOP,"
500 PRINT "BOUGHT A FRESH"
510 PRINT F$; "PIE, AND FED"
520 PRINT "IT TO ";B$;"", WHO"
530 PRINT "LOVED IT!"
540 PRINT "    THEN, ";N$
550 PRINT "HELPED ";L$;" DOWN"
560 PRINT "FROM THE TREE. THEY"
570 PRINT "RODE OFF ON THE"
580 PRINT A$;" AND LIVED"
590 PRINT "HAPPILY EVER AFTER."
600 PRINT "(",B$;" WENT ON TO"
610 PRINT "MAKE IT BIG IN PET"
620 PRINT "FOOD COMMERCIALS.)"
630 PRINT
640 PRINT TAB(6);"*THE END*"

```



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DRAW & PRINT

BY JOEY LATIMER

Any printer can list your BASIC programs and churn out your correspondence, but printing graphics is another story. Sure, some dot-matrix printers are specially equipped to do graphics—but these functions are hard to use from BASIC, and using them from other software depends on compatibility. Most letter-quality printers can't do graphics at all.

We wanted to find a way to work with graphics that wouldn't depend on special printer functions. The answer came to us in a flash: Write a graphics program that outputs characters any printer can handle—instead of the high-resolution lines and points that some cannot.

Draw & Print is the result. It's a rudimentary drawing program that works in text mode—letting you drive a cursor around the screen and create graphics using letters, numbers, and punctuation marks. Then, on your command, it will print out a hard copy of what's on your screen; any kind of standard printer will do.

Draw & Print has three modes of operation. In MOVE mode, the screen cursor will pass over screen contents without affecting them in any way. In DRAW mode you can assign any alphabetic character you like (including numbers and punctuation marks) to use in drawing. The cursor will print this character at each position it occupies as you drive it across the screen. In ERASE mode, the cursor will erase anything it passes over. In all three modes, the cursor is moved around the screen by pressing the "U" (up left), "I" (up), "O" (up right), "J" (left), "L" (right), "M" (down left), comma (down), and period (down right) keys.

Draw & Print's main



functions are accessed by pressing the CONTROL key (TRS-80 Models III/4 & CoCo and VIC-20 owners, see note below) in combination with another key, as follows:

CONTROL-M places you in MOVE mode. CONTROL-D places you in DRAW mode. CONTROL-E places you in ERASE mode. The current mode is displayed at the bottom of the screen.

CONTROL-S clears the screen, and places the cursor back in the center.

CONTROL-P prints out the screen.

CONTROL-Q quits *Draw & Print* and returns to BASIC.

When in DRAW mode, CONTROL-N lets you choose the character you want to draw with.

To change the drawing character, press CONTROL-N and then press the key for the new character.

Note: The TRS-80s have no CONTROL key. To activate *Draw & Print's* main functions, Model III & 4 owners should press the left SHIFT and down-arrow keys simultaneously (equivalent to pressing

CONTROL on other computers), together with one of the letter keys shown above. The TRS-80 Color Computer doesn't have a CONTROL key, either. CoCo owners should first press the up-arrow key, then afterwards, the appropriate letter key for the function desired. The VIC-20 has a CONTROL key, but it can't be read easily in BASIC. To access functions, VIC owners should press the COMMODORE key, along with the appropriate letter key.

PROGRAM NOTES

Draw & Print is a very simple program. Enterprising experimenters may wish to add features to the basic armature. A very useful addition would be functions that allow saving and loading screens to and from disk or cassette. Another good enhancement might be a TEXT mode that lets you write short memos with the program. Those whose computers can display colored text may wish to add a multicolor option to the DRAW mode.

Apple w/printer/Draw & Print

```
10 DIM MD$(3)
20 CX = 20:CY = 11:MODE = 1:CH = 32:CL = 32
30 MD$(1) = "MOVE":MD$(2) = "DRAW":MD$(3) = "ERASE"
40 MS = "MOVE MODE."
50 HOME
60 PRINT "*****DRAW & PRINT*****"
70 VTAB 24:HTAB 1
80 PRINT SPC(10);"YOU ARE IN ";MS;SPC(7)
90 HTAB CX:VTAB CY
100 IF MODE <> 1 THEN PRINT CHR$(CH);CHR$(8);
110 GET K$
120 K = ASC(K$):IF K = 19 THEN CX = 20:CY = 11:GOTO 50
130 IF K = 17 THEN HOME:END
140 IF K <> 13 AND K <> 4 AND K <> 5 THEN 190
150 IF MODE = 2 THEN CL = CH
160 MODE = (K = 13)+2*(K = 4)+3*(K = 5)
170 MS = MD$(MODE)+" MODE."
180 CH = CL*(MODE = 2)+32*(MODE = 3):GOTO 70
190 IF K <> 16 THEN 280
200 HTAB 1:VTAB 24
210 PRINT "PRESS ANY KEY WHEN PRINTER IS READY.";
220 GET K$:VTAB 23:PRINT
230 PRINT CHR$(4);"PR# 1"
240 PRINT:FOR Y = 2 TO 23:FOR X = 1 TO 40
250 Z = SCRN(X-1,2*(Y-1))+16*SCRN(X-1,2*(Y-1)+1)-128
260 PRINT CHR$(Z);:NEXT X:PRINT:NEXT Y
270 VTAB 23:PRINT:PRINT CHR$(4);"PR# 0":GOTO 70
280 IF MODE <> 2 OR K <> 14 THEN 340
290 HTAB 1:VTAB 24
300 PRINT "PRESS KEY FOR NEW DRAWING CHARACTER.";
310 GET K$
320 K = ASC(K$):IF K > 31 AND K < 123 THEN CH = K
330 GOTO 70
340 IF K > 85 THEN K = K-32
350 NX = CX+(K = 79 OR K = 76 OR K = 46)-(K = 85 OR K = 74 OR K = 77)
360 NY = CY+(K = 77 OR K = 44 OR K = 46)-(K = 85 OR K = 73 OR K = 79)
370 IF CX = NX AND CY = NY THEN 110
380 NX = NX+40*((NX < 1)-(NX > 40))
390 NY = NY+22*((NY < 2)-(NY > 23))
400 CX = NX:CY = NY:GOTO 90
```

Atari 400, 800, 600/800XL, & 130XE w/printer/Draw & Print

```
10 DIM M$(11),MD$(13),BL$(10)
20 CX=19:CY=11:MODE=1:CH=0:CL=0
30 SCR=PEEK(88)+PEEK(89)*256
```


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FC-03

CREATIVITY PROGRAM

```

40 OPEN #1,4,0,"K:"
50 MD$="MOVEDRAWERASE":MS="MOVE MODE."
60 BL$=CHR$(32):BL$(10)=BL$:BL$(2)=BL$
70 SETCOLOR 2,2,10:SETCOLOR 1,0,0
80 POKE 82,0:POKE 752,1
90 PRINT CHR$(125);
100 PRINT "*****DRAW & PRINT*****"
110 POKE SCR+CX+CY*40,CH+128
120 POSITION 0,23
130 PRINT BL$;"YOU ARE IN ";MS;BL$(1,7);
140 GET #1,K
150 IF K=19 THEN CX=19:CY=11:GOTO 90
160 IF K=17 THEN POKE 82,2:GRAPHICS 0:END
170 IF K<>13 AND K<>4 AND K<>5 THEN 250
180 IF MODE=2 THEN CL=CH
190 MODE=(K=13)+2*(K=4)+3*(K=5)
200 MS=MD$(MODE*4-3,MODE*4+(MODE=3))
210 MS$(LEN(MS)+1)=" MODE."
220 SETCOLOR 2,MODE*2,10
230 IF MODE=1 THEN CH=PEEK(SCR+CX+CY*40)-128:GOTO 110
240 CH=CL*(MODE=2):GOTO 110
250 IF K<>16 THEN 370
260 POSITION 0,23
270 PRINT "PRESS ANY KEY WHEN PRINTER IS READY.";
280 GET #1,K:TRAP 330:OPEN #2,8,0,"P:"
290 PRINT #2:FOR Y=1 TO 22:FOR X=0 TO 39
300 Z=PEEK(SCR+X+Y*40):Z=Z-128*(Z>127)
310 PUT #2,Z+32*(Z<64)
320 NEXT X:PUT #2,155:NEXT Y
330 CLOSE #2:TRAP 40000:IF PEEK(195)=0 THEN 120
340 POKE 195,0:POSITION 0,23
350 PRINT "ERROR. PLEASE PRESS ANY KEY.";BL$;
360 GET #1,K:GOTO 120
370 IF MODE<>2 OR K<>14 THEN 430
380 POSITION 0,23
390 PRINT "PRESS KEY FOR NEW DRAWING CHARACTER.";
400 GET #1,K
410 IF K>31 AND K<123 AND K<>96 THEN CH=K-32*(K<96)
420 GOTO 110
430 IF K>85 THEN K=K-32
440 NX=CX+(K=79 OR K=76 OR K=46)-(K=85 OR K=74 OR K=77)
450 NY=CY+(K=77 OR K=44 OR K=46)-(K=85 OR K=73 OR K=79)
460 IF CX=NX AND CY=NY THEN 140
470 NX=NX+40*((NX<0)-(NX>39))
480 NY=NY+22*((NY<1)-(NY>22))
490 POKE SCR+CX+CY*40,CH
500 IF MODE=1 THEN CH=PEEK(SCR+NX+NY*40)
510 POKE SCR+NX+NY*40,CH+128
520 CX=NX:CY=NY:GOTO 140

```

Commodore 64 & 128 (C 64 mode) w/prINTER/Draw & Print

```

10 DIM MD$(3)
20 CX=19:CY=11:MODE=1:CH=32:CL=32:SC=1024:CM=55296
30 MD$(1)="MOVE":MD$(2)="DRAW":MD$(3)="ERASE"
40 MS="MOVE MODE."
50 BL$=CHR$(32):FOR I=2 TO 10:BL$=BL$+CHR$(32):NEXT I
60 POKE 53280,2:POKE 53281,1
70 PRINT CHR$(142);CHR$(8);
80 PRINT CHR$(147);CHR$(144);
90 PRINT "*****DRAW & PRINT*****"
100 POKE SC+CX+CY*40,CH+128:POKE CM+CX+CY*40,0
110 POKE 214,23:PRINT
120 PRINT BL$;"YOU ARE IN ";MS;LEFT$(BL$,7);
130 GET K$:IF K$="" THEN 130
140 K=ASC(K$):IF K=19 THEN CX=19:CY=11:GOTO 80
150 IF K=17 THEN SYS 770:END
160 IF K<>13 AND K<>4 AND K<>5 THEN 230
170 IF MODE=2 THEN CL=CH
180 MODE=-((K=13)+2*(K=4)+3*(K=5))

```

```

190 MS=MD$(MODE)+" MODE."
200 POKE 53280,MODE*2
210 IF MODE=1 THEN CH=PEEK(SC+CX+CY*40)-128:GOTO 100
220 CH=-CL*(MODE=2)-32*(MODE=3):GOTO 100
230 IF K<>16 THEN 310
240 POKE 214,23:PRINT
250 PRINT "PRESS ANY KEY WHEN PRINTER IS READY.";
260 GET K$:IF K$="" THEN 260
270 OPEN 4,4:PRINT#4:FOR Y=1 TO 23:FOR X=0 TO 39
280 Z=PEEK(SC+X+Y*40):Z=Z+128*(Z>127):Z=Z-64*(Z<32)
290 PRINT#4,CHR$(Z);:NEXT X:PRINT#4:NEXT Y
300 PRINT#4:CLOSE 4:GOTO 100
310 IF MODE<>2 OR K<>14 THEN 370
320 POKE 214,23:PRINT
330 PRINT "PRESS KEY FOR NEW DRAWING CHARACTER.";
340 GET K$:IF K$="" THEN 340
350 K=ASC(K$):IF K>31 AND K<91 THEN CH=K+64*(K>63)
360 GOTO 100
370 NX=CX-(K=79 OR K=76 OR K=46)+(K=85 OR K=74 OR K=77)
380 NY=CY-(K=77 OR K=44 OR K=46)+(K=85 OR K=73 OR K=79)
390 IF CX=NX AND CY=NY THEN 130
400 NX=NX-40*((NX<0)-(NX>39))
410 NY=NY-22*((NY<1)-(NY>23))
420 POKE SC+CX+CY*40,CH
430 IF MODE=1 THEN CH=PEEK(SC+NX+NY*40)
440 POKE SC+NX+NY*40,CH+128:POKE CM+NX+NY*40,0
450 CX=NX:CY=NY:GOTO 130

```

IBM PC & compatibles* w/prINTER (80-column version)/Draw & Print

```

10 DIM MD$(3)
20 WIDTH 80:SCREEN 0,0:KEY OFF
30 CX=40:CY=11:MODE=1:CH=32:CL=32
40 MD$(1)="MOVE":MD$(2)="DRAW":MD$(3)="ERASE"
50 MS="MOVE MODE."
60 CLS
70 PRINT " ";STRING$(33,42);"DRAW & PRINT";STRING$(33,42)
80 LOCATE 24,1,0
90 PRINT SPC(29);"YOU ARE IN ";MS;SPC(28);
100 LOCATE CY,CX,1,0,7
110 IF MODE<>1 THEN PRINT CHR$(CH);CHR$(29);
120 K$=INKEY$:IF K$="" THEN 120
130 K=ASC(K$):IF K=19 THEN CX=40:CY=11:GOTO 60
140 IF K=17 THEN CLS:END
150 IF K<>13 AND K<>4 AND K<>5 THEN 200
160 IF MODE=2 THEN CL=CH
170 MODE=-((K=13)+2*(K=4)+3*(K=5))
180 MS=MD$(MODE)+" MODE."
190 CH=-CL*(MODE=2)-32*(MODE=3):GOTO 80
200 IF K<>16 THEN 270
210 LOCATE 24,1,0
220 PRINT SPC(20);"PRESS ANY KEY WHEN PRINTER IS READY .";
230 K$=INKEY$:IF K$="" THEN 230
240 LPRINT:FOR Y=2 TO 23:FOR X=2 TO 79
250 LPRINT CHR$(SCREEN(Y,X));:NEXT X:LPRINT:NEXT Y
260 GOTO 80
270 IF MODE<>2 OR K<>14 THEN 330
280 LOCATE 24,1,0
290 PRINT SPC(20);"PRESS KEY FOR NEW DRAWING CHARACTER .";
300 K$=INKEY$:IF K$="" THEN 300
310 K=ASC(K$):IF K>31 AND K<123 THEN CH=K
320 GOTO 80
330 IF K>85 THEN K=K-32
340 NX=CX-(K=79 OR K=76 OR K=46)+(K=85 OR K=74 OR K=77)
350 NY=CY-(K=77 OR K=44 OR K=46)+(K=85 OR K=73 OR K=79)

```




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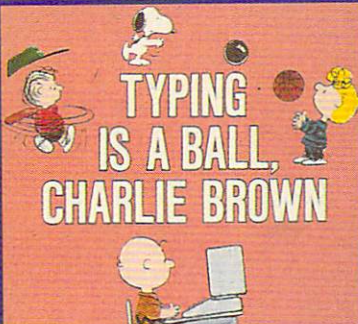
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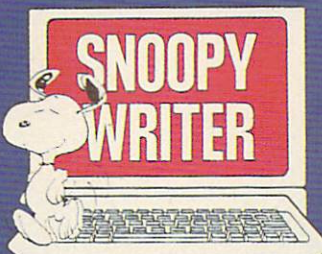
Charlie Brown's
1,2,3's



Typing
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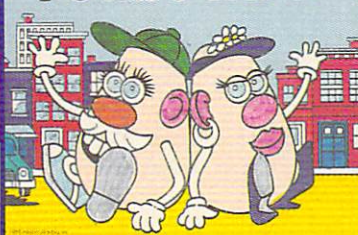
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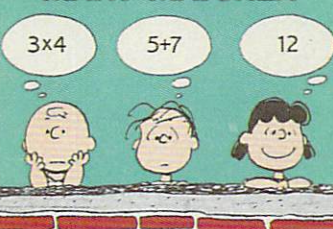
Charlie Brown's
ABC's



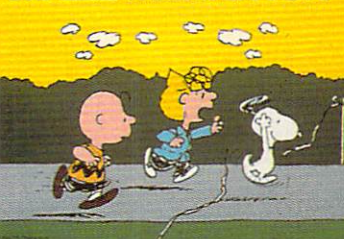
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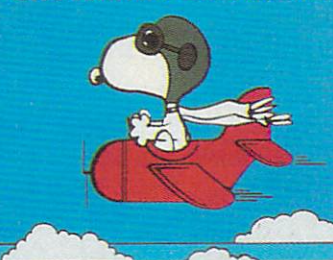
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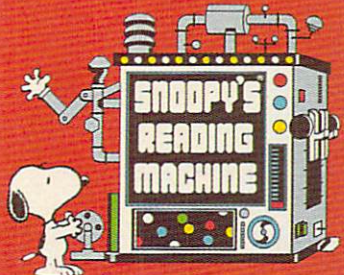
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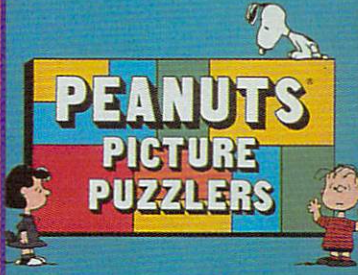
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CREATIVITY PROGRAM

```
360 IF CX=NX AND CY=NY THEN 120
370 NX=NX-78*((NX<2)-(NX>79))
380 NY=NY-22*((NY<2)-(NY>23))
390 CX=NX:CY=NY:GOTO 100
```

* This program has been tested on the following computers, using the BASICs shown: IBM PC w/Color Graphics Adapter or Monochrome Printer card. w/Disk BASIC D2.00 or Advanced BASIC A2.00. IBM PCjr. w/Cassette BASIC C1.20 and Cartridge BASIC J1.00. Tandy 1000. w/GW-BASIC 2.02 versions 00.05.00 & 01.01.00.

IBM PC & compatibles** w/printer (80-column version)/Draw & Print

```
10 DIM MD$(3)
20 WIDTH 40:SCREEN 0,0:KEY OFF
30 CX=20:CY=11:MODE=1:CH=32:CL=32
40 MD$(1)="MOVE":MD$(2)="DRAW":MD$(3)="ERASE"
50 M$="MOVE MODE."
60 CLS
70 PRINT STRING$(14,42);"DRAW & PRINT";STRING$(14,42);
80 LOCATE 24,1,0
90 PRINT SPC(9);"YOU ARE IN ";M$;SPC(8);
100 LOCATE CY,CX,1,0,7
110 IF MODE<>1 THEN PRINT CHR$(CH);CHR$(29);
120 K$=INKEY$:IF K$="" THEN 120
130 K=ASC(K$):IF K=19 THEN CX=20:CY=11:GOTO 60
140 IF K=17 THEN CLS:END
150 IF K<>13 AND K<>4 AND K<>5 THEN 200
160 IF MODE=2 THEN CL=CH
170 MODE=-((K=13)+2*(K=4)+3*(K=5))
180 M$=MD$(MODE)+" MODE."
190 CH=-CL*(MODE=2)-32*(MODE=3):GOTO 80
200 IF K<>16 THEN 270
210 LOCATE 24,1,0
220 PRINT "PRESS ANY KEY WHEN PRINTER IS READY.";
230 K$=INKEY$:IF K$="" THEN 230
240 LPRINT:FOR Y=2 TO 23:FOR X=1 TO 40
250 LPRINT CHR$(SCREEN(Y,X));:NEXT X:LPRINT:NEXT Y
260 GOTO 80
270 IF MODE<>2 OR K<>14 THEN 330
280 LOCATE 24,1,0
290 PRINT "PRESS KEY FOR NEW DRAWING CHARACTER.";
300 K$=INKEY$:IF K$="" THEN 300
310 K=ASC(K$):IF K>31 AND K<123 THEN CH=K
320 GOTO 80
330 IF K>85 THEN K=K-32
340 NX=NX-(K=79 OR K=76 OR K=46)+(K=85 OR K=74 OR K=77)
350 NY=CY-(K=77 OR K=44 OR K=46)+(K=85 OR K=73 OR K=79)
360 IF CX=NX AND CY=NY THEN 120
370 NX=NX-40*((NX<1)-(NX>40))
380 NY=NY-22*((NY<2)-(NY>23))
390 CX=NX:CY=NY:GOTO 100
```

** This program has been tested on the following computers, using the BASICs shown: IBM PC w/Color Graphics Adapter, w/Disk BASIC D2.00 and Advanced BASIC A2.00. IBM PCjr. w/Cassette BASIC C1.20 and Cartridge BASIC J1.00. Tandy 1000 w/GW-BASIC 2.02 versions 00.05.00 & 01.01.00.

TRS-80 Color Computer w/printer/Draw & Print

```
10 DIM MD$(3)
20 CX=16:CY=7:MODE=1:CH=96:CL=96:SC=1024:F=0:D=0
30 MD$(1)="MOVE":MD$(2)="DRAW":MD$(3)="ERASE"
40 M$="MOVE MODE."
50 CLS:PRINT "*****DRAW & PRINT*****"
60 PRINT@480,TAB(5);"YOU ARE IN ";M$;" ";
70 K$=INKEY$:IF K$="" AND D>0 THEN D=D-1:GOTO 70
80 POKE SC+CX+CY*32,-CH*(F OR K$<>"")-159*(NOT F AND K$="")
90 IF K$="" THEN F=NOT F:D=5:GOTO 70 ELSE D=0:F=0
```

```
100 K=ASC(K$)+32*(ASC(K$)>94):IF K<>94 THEN 320
110 K$=INKEY$:IF K$="" THEN 110
120 K=ASC(K$):IF K=83 THEN CX=16:CY=7:GOTO 50
130 IF K=81 THEN CLS:END
140 IF K<>77 AND K<>68 AND K<>69 THEN 200
150 IF MODE=2 THEN CL=CH
160 MODE=-((K=77)+2*(K=68)+3*(K=69))
170 M$=MD$(MODE)+" MODE."
180 IF MODE=1 THEN CH=PEEK(SC+CX+CY*32):GOTO 60
190 CH=-CL*(MODE=2)-96*(MODE=3):GOTO 60
200 IF K<>80 THEN 260
210 PRINT@480,"PRESS KEY WHEN PRINTER READY.";
220 PRINT#-2:FOR Y=1 TO 14:FOR X=0 TO 31
230 Z=PEEK(SC+X+Y*32):Z=Z-96*(Z<37)+64*(Z>95)
240 PRINT#-2,CHR$(Z);
250 NEXT X:PRINT#-2:NEXT Y:GOTO 60
260 IF MODE<>2 OR K<>78 THEN 70
270 PRINT@480,"PRESS KEY FOR NEW CHARACTER.";
280 K$=INKEY$:IF K$="" THEN 280
290 K=ASC(K$)
300 IF (K<32 OR K>93) AND (K<97 OR K>122) THEN 60
310 CH=K-64*(K<64)+96*(K>96):GOTO 60
320 NX=NX-(K=79 OR K=76 OR K=46)+(K=85 OR K=74 OR K=77)
330 NY=CY-(K=77 OR K=44 OR K=46)+(K=85 OR K=73 OR K=79)
340 IF CX=NX AND CY=NY THEN 70
350 NX=NX-32*((NX<0)-(NX>31))
360 NY=NY-14*((NY<1)-(NY>14))
370 IF MODE=1 THEN CH=PEEK(SC+NX+NY*32)
380 CX=NX:CY=NY:GOTO 70
```

TRS-80 Model III & Model 4 w/Model III BASIC w/printer/Draw & Print

```
10 DIM MD$(3)
20 CX=31:CY=8:MODE=1:CH=32:CL=32:SC=15360:F=-1:D=0
30 MD$(1)="MOVE":MD$(2)="DRAW":MD$(3)="ERASE"
40 M$="MOVE MODE."
50 CLS
60 PRINT STRING$(26,42);"DRAW & PRINT";STRING$(26,42);
70 PRINT@960,STRING$(21,32);"YOU ARE IN ";M$;STRING$(19,32);
80 K$=INKEY$:IF D>0 AND K$="" THEN D=D-1:GOTO 80
90 PRINT@CX+CY*64,CHR$(-CH*(F OR K$<>"")-143*(NOT F AND K$=""));
100 IF K$="" THEN F=NOT F:D=5:GOTO 80 ELSE D=0:F=0
110 K=ASC(K$):IF K=19 THEN CX=31:CY=8:GOTO 50
120 IF K=17 THEN CLS:END
130 IF K<>13 AND K<>4 AND K<>5 THEN 190
140 IF MODE=2 THEN CL=CH
150 MODE=-((K=13)+2*(K=4)+3*(K=5))
160 M$=MD$(MODE)+" MODE."
170 IF MODE=1 THEN CH=PEEK(SC+CX+CY*64):GOTO 70
180 CH=-CL*(MODE=2)-32*(MODE=3):GOTO 70
190 IF K<>16 THEN 250
200 PRINT@974,"PRESS ANY KEY WHEN PRINTER IS READY.";
210 K$=INKEY$:IF K$="" THEN 210
220 LPRINT:FOR Y=1 TO 14:FOR X=0 TO 63
230 Z=PEEK(SC+X+Y*64)
240 LPRINT CHR$(Z);:NEXT X:LPRINT:NEXT Y:GOTO 70
250 IF MODE<>2 OR K<>14 THEN 300
260 PRINT@974,"PRESS KEY FOR NEW DRAWING CHARACTER.";
270 K$=INKEY$:IF K$="" THEN 270
280 K=ASC(K$):IF K>31 AND K<123 THEN CH=K
290 GOTO 70
300 IF K>85 THEN K=K-32
310 NX=NX-(K=79 OR K=76 OR K=46)+(K=85 OR K=74 OR K=77)
320 NY=CY-(K=77 OR K=44 OR K=46)+(K=85 OR K=73 OR K=79)
330 IF CX=NX AND CY=NY THEN 80
340 NX=NX-64*((NX<0)-(NX>63))
```


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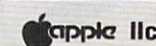
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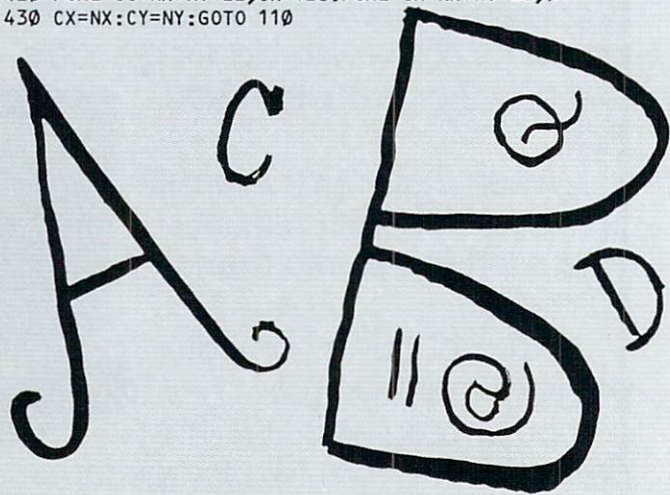
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CREATIVITY PROGRAM

```
350 NY=NY-14*((NY<1)-(NY>14))
360 IF MODE=1 THEN CH=PEEK(SC+NX+NY*64)
370 CX=NX:CY=NY:GOTO 80
```

VIC-20 w/printer/Draw & Print

```
10 DIM MD$(3)
20 CX=11:CY=11:MODE=1:CH=32:CL=32:SC=7680:CM=38400
30 MD$(1)="MOVE":MD$(2)="DRAW":MD$(3)="ERASE"
40 MS="MOVE MODE."
50 POKE 36879,26:PRINT CHR$(142);CHR$(8);
60 PRINT CHR$(147);CHR$(144);
70 PRINT "*****DRAW & PRINT*****";
80 POKE SC+CX+CY*22,CH+128:POKE CM+CX+CY*22,0
90 POKE 214,21:PRINT
100 PRINT "YOU'RE IN ";MS;
110 GET K$:IF K$="" THEN 110
120 K=ASC(K$):IF K=174 THEN CX=11:CY=11:GOTO 60
130 IF K=171 THEN POKE 36879,27:PRINT CHR$(147);CHR$(3
1);CHR$(9);:END
140 IF K<>167 AND K<>172 AND K<>177 THEN 210
150 IF MODE=2 THEN CL=CH
160 MODE=-((K=167)+2*(K=172))+3*(K=177))
170 MS=MD$(MODE)+" MODE.":IF MODE<>3 THEN MS=MS+" "
180 POKE 36879,MODE+25
190 IF MODE=1 THEN CH=PEEK(SC+CX+CY*22)-128:GOTO 80
200 CH=-CL*(MODE=2)-32*(MODE=3):GOTO 80
210 IF K<>175 THEN 290
220 POKE 214,21:PRINT
230 PRINT "PRESS KEY TO PRINT. ";
240 GET K$:IF K$="" THEN 240
250 OPEN 4,4:PRINT#4:FOR Y=1 TO 21:FOR X=0 TO 21
260 Z=PEEK(SC+X+Y*22):Z=Z+128*(Z>127):Z=Z-64*(Z<32)
270 PRINT#4,CHR$(Z);:NEXT X:PRINT#4:NEXT Y
280 PRINT#4:CLOSE 4:GOTO 80
290 IF MODE<>2 OR K<>170 THEN 350
300 POKE 214,21:PRINT
310 PRINT "PRESS NEW CHARACTER.";
320 GET K$:IF K$="" THEN 320
330 K=ASC(K$):IF K>31 AND K<91 THEN CH=K+64*(K>63)
340 GOTO 80
350 NX=CX-(K=79 OR K=76 OR K=46)+(K=85 OR K=74 OR K=77)
360 NY=CY-(K=77 OR K=44 OR K=46)+(K=85 OR K=73 OR K=79)
370 IF CX=NX AND CY=NY THEN 110
380 NX=NX-22*((NX<0)-(NX>21))
390 NY=NY-21*((NY<1)-(NY>21))
400 POKE SC+CX+CY*22,CH
410 IF MODE=1 THEN CH=PEEK(SC+NX+NY*22)
420 POKE SC+NX+NY*22,CH+128:POKE CM+NX+NY*22,0
430 CX=NX:CY=NY:GOTO 110
```



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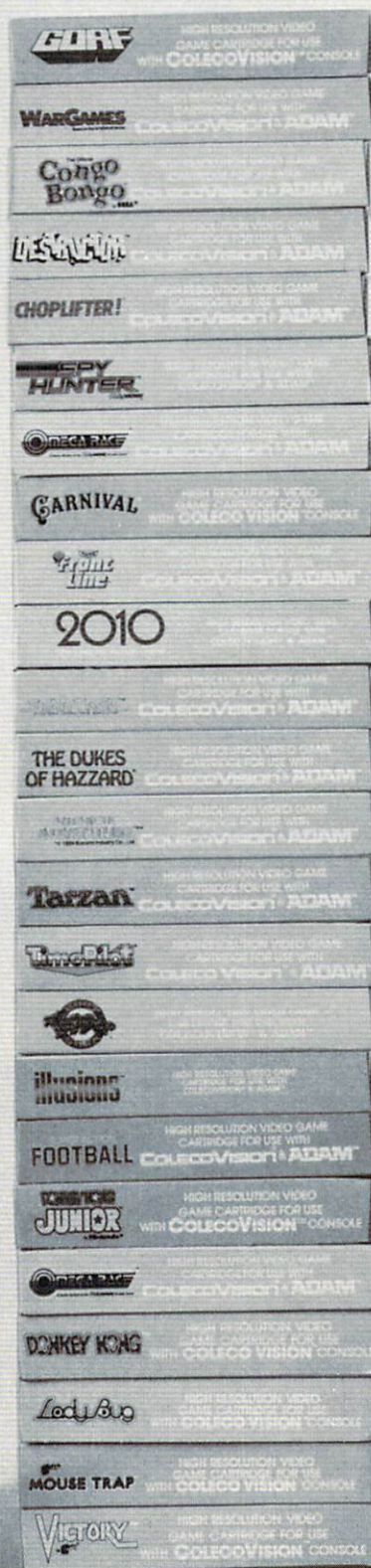
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PASSWORDS TO PONDER

Take A Stroll Down Applecreek Road

PUZZLE BY PETER FAVARO AND SARAH KORTUM
PROGRAM BY STEVEN C.M. CHEN

A hundred years ago, in the sleepy little hollow of Appleton, Wisconsin, lived the Weiss family. Five of the six Weiss children enjoyed doing odd jobs for the shopkeepers on Applecreek Road. But young Ehrich had the wanderlust of a seasoned vagabond even at the ripe old age of 10. When the circus was in town, there was no keeping track of Ehrich. He was always hanging around the tents, fascinated by the jugglers, escape artists, and magicians.

While Ehrich was a reluctant worker, he was an indefatigable entertainer. After supper he would often put on his own special shows that delighted the whole family, especially his mother, Cecelia.

Often, the way that Ehrich performed his stunts was a mystery. For instance, there was the time Ehrich instructed his siblings to lock him inside the wood bin. He planned to

make believe he was a ghost when his father, the Reverend Samuel Weiss, went to gather wood that evening. Ehrich's siblings clued their father in on the plan, and the Reverend decided to play a practical joke in return. With the whole family present, he unlocked the wood bin and doused its contents with water. The family was surprised to hear Ehrich standing behind them asking, "Why in the world would anyone want to soak perfectly good kindling with water?" To this day, no one knows how Ehrich escaped from the locked bin.

More than anything else, Ehrich loved to plan and execute disappearing acts. He would leave cryptic notes, defying everyone in the house to figure them out in order to guess his whereabouts. He would stubbornly remain in hiding past mealtimes or bedtime until someone was

smart enough to discover him.

One hot Saturday in July, Mrs. Weiss hammered the last nail into a crate of books that was to be picked up momentarily by the library, and then announced that it was time for breakfast. Everyone but Ehrich showed up. When Mrs. Weiss checked the wood bin (Ehrich's favorite hiding place), she discovered two scraps of paper with the following words in Ehrich's handwriting: Book and Word. Somewhat miffed at the timing of her son's latest disappearance, Mrs. Weiss yelled, "Ehrich! If you don't get to breakfast in one minute I'm going to feed your eggs to the dog!" She set Ehrich's napkin ring on the table, and then noticed that in place of the white linen was a curled-up scrap of paper that read.

"Guess the password for every address on Apple-

creek Road, dear Mother, and then you will be allowed into the library, where a surprise awaits you! Two passwords are hidden in the wood bin to get you started. The one that starts with "B" is the password for our house; the other is for the library. Good luck! Your loving son, Ehrich."

A doting mother, Mrs. Weiss headed down Applecreek Road after breakfast to solve her son's latest prank. Ehrich's five brothers and sisters supplied the passwords for the places where they were working that day. But the proprietors of the other establishments along the road stubbornly refused to divulge their passwords, although they had suspicious smiles on their faces. Figuring that her son had roped not only the family, but all of Applecreek Road into his latest prank, Mrs. Weiss was more determined than ever to discover



er the system behind the passwords and gain entry into the library.

HOW TO PLAY

Type each line of the program into your computer exactly as shown, carefully making the appropriate modifications (if needed). (See "Tips to the Typist," page 54, for help with typing in programs.) Then SAVE it to disk or cassette.

When you RUN the program, you play the part of Mrs. Weiss. To visit any of the establishments along Applecreek Road, type in the street number (103 to 141) and press RETURN or ENTER. If you're lucky and one of the Weiss children is at that concern, you'll find out its password; otherwise, you'll have to

guess. You won't be allowed into the library (at number 143) to get your surprise until you've correctly guessed the passwords for all the other addresses along the road.

Careful study of the Applecreek Road illustration (below) may help you guess the passwords. Also, when you've made an incorrect guess, you'll be given the opportunity to ask for a hint. Paradoxically, the more passwords you've learned, the more helpful the hint may be! So you may want to ask for a hint more than once as you play.

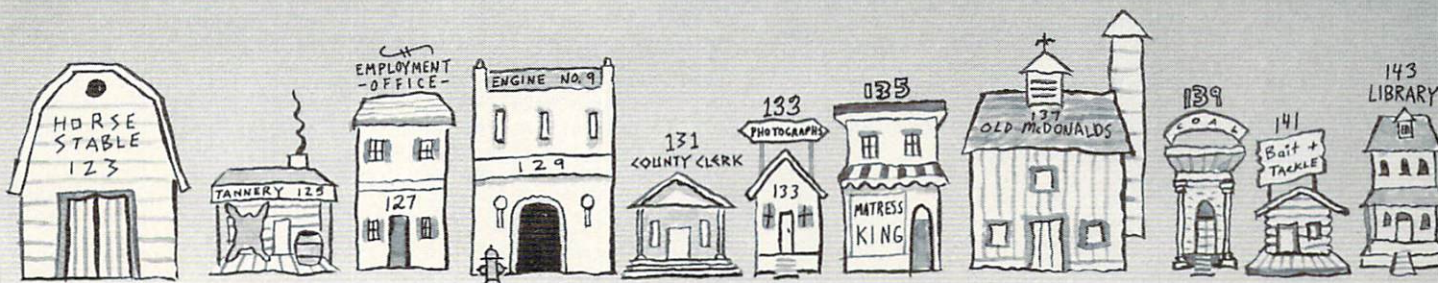
When you're done, you can confirm that you've solved the puzzle correctly by checking the solution on page 78.

Apple/Passwords to Ponder

```
10 DIM WDS(22),ZS(32),PT(38),RC(22)
20 SW = 40:DL = 500:BM = 22
30 ALL = 0:FOR X = 1 TO 22:RC(X) = 0
40 READ WDS(X):NEXT X:SP$ = CHR$(32)
50 RC(1) = 2:RC(22) = 2:ZS(1) = "":ZS(2) = "":SP$
60 FOR X = 3 TO 32:READ ZS(X):NEXT X
70 FOR X = 1 TO 38:READ PT(X):NEXT X
80 DS = ZS(11):FOR X = 1 TO 38
90 IF PT(X) > 2 THEN DS = DS+SP$
100 DS = DS+ZS(PT(X)):NEXT X:DS = DS+"?"
110 FOR X = 1 TO 5
120 T = INT(RND(1)*20)+2:IF RC(T) <> 0 THEN 120
```

```
130 RC(T) = 1:NEXT X
140 FOR X = 1 TO 22:TS = "":AS = WDS(X)
150 V = ASC(LEFT$(AS,1))-64:FOR Y = 2 TO LEN(AS)
160 N = ASC(MID$(AS,Y,1))-V
170 TS = TS+CHR$(N+26*(N < 65)):NEXT Y
180 WDS(X) = TS:NEXT X
190 HOME:MS = "PASSWORDS TO PONDER":GOSUB 1000:PRINT
200 MS = "WHAT PLACE ON APPLECREEK ROAD WOULD YOU?"
210 MS = MS+" LIKE TO VISIT?":GOSUB 2000:PRINT
220 MS = "(TYPE THE NUMBER, <H> FOR A HINT,"
230 MS = MS+" OR <Q> TO QUIT; THEN PRESS <RETURN>.)"
240 VP = BM:HP = 1:GOSUB 3000:GOSUB 2000
250 VP = 6:HP = 1:GOSUB 3000
260 INPUT "NUMBER: ";NUM$:IF NUM$ = "" THEN 250
270 HOME:NUM = VAL(NUM$):IF NUM <> 0 THEN 370
280 K$ = LEFT$(NUM$,1):GOSUB 4010
290 IF K$ = "Q" THEN END
300 IF K$ <> "H" THEN 190
310 FOR Y = 1 TO 11:FOR X = 1 TO 2
320 V = Y+(X-1)*11:HP = SW-SW/X+1
330 VP = Y+1:GOSUB 3000:PRINT V*2+99
340 IF RC(V) < 2 THEN 360
350 HP = HP+5:GOSUB 3000:PRINT WDS(V)
360 NEXT X:NEXT Y:GOSUB 5000:GOTO 190
370 NUM = NUM-100:IF NUM < 1 OR NUM > 43 THEN 190
380 IF INT(NUM/2) = NUM/2 THEN 190
390 NUM = (NUM+1)/2:IF NUM = 22 THEN 630
400 IF RC(NUM) = 0 THEN 470
410 IF RC(NUM) = 1 THEN RC(NUM) = 3:GOTO 440
420 MS = "YOU ALREADY KNOW THAT THE PASSWORD"
430 MS = MS+" HERE IS "+WDS(NUM)+"":GOTO 460
440 NS = "HELLO, MOTHER.":GOSUB 1000
450 MS = "THE PASSWORD HERE IS "+WDS(NUM)+"".
460 GOSUB 2000:GOSUB 5000:GOTO 570
470 MS = "HELLO, MRS. WEISS! WHAT DO YOU THINK"
480 MS = MS+" MY SECRET PASSWORD IS?":GOSUB 2000
490 PRINT:INPUT TS:HOME
500 LT = LEN(TS):IF LT = 0 THEN 540
510 PASS$ = "":FOR X = 1 TO LT:K$ = MID$(TS,X,1)
520 GOSUB 4010:PASS$ = PASS$+K$:NEXT X
530 IF PASS$ = WDS(NUM) THEN 560
540 NS = "SORRY, YOU'RE WRONG!":GOSUB 1000
550 GOSUB 5000:GOTO 190
560 NS = "YOU GUESSED IT!":GOSUB 1000:GOSUB 5000
570 HOME:RC(NUM) = 2:ALL = 1
580 FOR X = 2 TO 21:IF RC(X) < 2 THEN ALL = 0:X = 21
```

APPLETON WISCONSIN



PUZZLE

```

590 NEXT X:IF NOT ALL THEN 190
600 HOME:M$ = "YOU NOW KNOW EVERY PASSWORD AND CAN"
610 M$ = M$+" GET YOUR SURPRISE AT THE LIBRARY."
620 GOSUB 2000:GOSUB 5000:GOTO 190
630 IF ALL THEN 670
640 M$ = "SORRY! YOU CAN'T GET YOUR SURPRISE UNTIL"
650 M$ = M$+" YOU KNOW ALL THE PASSWORDS."
660 GOSUB 2000:GOSUB 5000:GOTO 190
670 FOR DE = 1 TO DL:NEXT DE
680 M$ = D$:GOSUB 2000:END
1000 IF LEN(M$) = SW THEN PRINT N$;:RETURN
1010 PRINT TAB((SW-LEN(M$))/2+1);N$;:RETURN
2000 IF LEN(M$) <= SW THEN N$ = M$:GOSUB 1000:RETURN
2010 Y = SW+1:Z = 1:FOR X = Y TO 2 STEP -1
2020 IF MID$(M$,X,1) = SP$ THEN Z = 0:Y = X:X = 2
2030 NEXT X:PRINT LEFT$(M$,Y-1);
2040 IF Y-1 < SW THEN PRINT
2050 M$ = RIGHT$(M$,LEN(M$)-Y+Z):GOTO 2000
3000 VTAB VP:HTAB HP:RETURN
4000 GET K$:IF K$ = CHR$(3) THEN END
4010 IF K$ > CHR$(96) THEN K$ = CHR$(ASC(K$)-32)
4020 RETURN
5000 VP = BM:HP = 1:GOSUB 3000
5010 M$ = "PRESS ANY KEY TO CONTINUE."
5020 GOSUB 2000:GOSUB 4000:RETURN
6000 DATA YANNJ,PREEJ,SUHTM,GILHA,PRUBJ,SIXEM
6010 DATA KAPDE,TJIMN,PFEIU,PHEIU,IARBN,RJAVW
6020 DATA SABWX,LTUDQ,UADMZ,GMPSL,LRUXY,SYBKF
6030 DATA LRMDY,QNRID,XUMPK,LIADP
7000 DATA A,BY,IS,IN,OF,CAN,YOU,THE,TWO
7010 DATA EYES,FROM,LIFE,NAME,PEER,WENT,YOUR
7020 DATA BOOKS,CRACK,CRATE,GUESS,LATER
7030 DATA BESIDE,EHRICH,HAVING,NAILED
7040 DATA ESCAPED,SECONDS,THROUGH,STANDING,SUDDENLY
8000 DATA 12,16,30,3,20,6,18,21,7,19,2,29
8010 DATA 23,25,5,31,24,9,1,26,32,28,13,10,27
8020 DATA 21,2,8,9,22,10,15,25,17,4,23,6,14

```

Atari 400, 800, 600/800XL, & 130XE/Passwords to Ponder

```

10 DIM CL$(1),D$(200),K$(1),NUM$(5)
20 DIM PASS$(4),SP$(1),T$(8),WD$(88),Z$(140)
30 DIM PT(38),PZ(33),RC(22)
40 OPEN #1,4,0,"K:":POKE 82,0
50 SETCOLOR 2,9,4:CL$=CHR$(125):SP$=CHR$(32)
60 ALL=0:FOR X=1 TO 22:RC(X)=0
70 READ T$:V=ASC(T$(1,1))-64
80 FOR Y=2 TO 5:N=ASC(T$(Y,Y))-V
90 WD$(LEN(WD$)+1)=CHR$(N+26*(N<65))
100 NEXT Y:NEXT X
110 RC(1)=2:RC(22)=2:Z$(1)=",":Z$(2)=".":Z$(3)=SP$
120 PZ(1)=1:PZ(2)=2
130 FOR X=3 TO 32:READ T$:PZ(X)=LEN(Z$)+1
140 Z$(PZ(X))=T$:NEXT X:PZ(33)=LEN(Z$)+1
150 FOR X=1 TO 38:READ T$:PT(X)=T$:NEXT X
160 D$=Z$(22,24):FOR X=1 TO 38
170 IF PT(X)>2 THEN D$(LEN(D$)+1)=SP$
180 A=PZ(PT(X)):B=PZ(PT(X)+1):T=LEN(D$)+1
190 D$(T)=Z$(A,B-1):NEXT X
200 D$(200)="?":FOR X=1 TO 5
210 T=INT(RND(1)*20)+2:IF RC(T)<>0 THEN 210
220 RC(T)=1:NEXT X
230 PRINT CL$:POSITION 10,0
240 PRINT "PASSWORDS TO PONDER":PRINT
250 PRINT "WHAT PLACE ON APPLECREEK ROAD WOULD YOU"
260 PRINT "LIKE TO VISIT?":POSITION 0,21
270 PRINT "(TYPE THE NUMBER, <H> FOR A HINT, OR <Q>";
280 PRINT "TO QUIT; THEN PRESS <RETURN>.)"
290 POSITION 0,6:PRINT "NUMBER";
300 POKE 752,0:INPUT NUM$:IF NUM$="" THEN 290
310 POKE 752,1:PRINT CL$;:TRAP 330
320 NUM=VAL(NUM$):IF NUM<>0 THEN 410
330 TRAP 40000:K$=NUM$(1,1):GOSUB 1000
340 IF K$="Q" THEN POKE 752,0:POKE 82,2:END

```

```

350 IF K$<>"H" THEN 230
360 FOR YP=1 TO 11:FOR XP=1 TO 2:V=YP+(XP-1)*11
370 POSITION 40-40/XP,YP:PRINT V*2+99;
380 IF RC(V)<2 THEN 400
390 PRINT CHR$(32);WD$(V*4-3,V*4)
400 NEXT XP:NEXT YP:GOSUB 2000:GOTO 230
410 NUM=NUM-100:IF NUM<1 OR NUM>43 THEN 230
420 IF INT(NUM/2)=NUM/2 THEN 230
430 NUM=(NUM+1)/2:IF NUM=22 THEN 670
440 IF RC(NUM)=0 THEN 510
450 IF RC(NUM)=1 THEN RC(NUM)=3:GOTO 480
460 PRINT "YOU ALREADY KNOW THAT THE PASSWORD HERE"
470 PRINT "IS ";WD$(NUM*4-3,NUM*4);".":GOTO 500
480 PRINT "HELLO, MOTHER. THE PASSWORD HERE IS"
490 PRINT WD$(NUM*4-3,NUM*4);".":
500 GOSUB 2000:GOTO 610
510 PRINT "HELLO, MRS. WEISS! WHAT DO YOU THINK"
520 PRINT "MY SECRET PASSWORD IS?":PRINT
530 POKE 752,0:INPUT T$:POKE 752,1:PRINT CL$
540 LT=LEN(T$):IF LT=0 THEN 580
550 PASS$="":FOR X=1 TO LT:K$=T$(X,X)
560 GOSUB 1000:PASS$(X,X)=K$:NEXT X
570 IF PASS$=WD$(NUM*4-3,NUM*4) THEN 600
580 POSITION 9,0:PRINT "SORRY, YOU'RE WRONG!"
590 GOSUB 2000:GOTO 230
600 POSITION 11,0:PRINT "YOU GUESSED IT!":GOSUB 2000
610 PRINT CL$:RC(NUM)=2:ALL=1
620 FOR X=2 TO 21:IF RC(X)<2 THEN ALL=0:X=21
630 NEXT X:IF NOT ALL THEN 230
640 PRINT CL$;"YOU NOW KNOW EVERY PASSWORD AND CAN GET "
650 PRINT "YOUR SURPRISE AT THE LIBRARY."
660 GOSUB 2000:GOTO 230
670 IF ALL THEN 710
680 PRINT "SORRY! YOU CAN'T GET YOUR SURPRISE"
690 PRINT "UNTIL YOU KNOW ALL THE PASSWORDS."
700 GOSUB 2000:GOTO 230
710 FOR DE=1 TO 200:NEXT DE:POKE 82,2
720 PRINT CL$:D$(1,106):PRINT D$(108,139)
730 PRINT D$(141,177):PRINT D$(179,200)
740 POKE 752,0:END
1000 IF K$>CHR$(96) THEN K$=CHR$(ASC(K$)-32)
1010 RETURN
2000 POSITION 7,22
2010 PRINT "PRESS ANY KEY TO CONTINUE.";
2020 GET #1,K:RETURN
3000 DATA YANNJ,PREEJ,SUHTM,GILHA,PRUBJ,SIXEM
3010 DATA KAPDE,TJIMN,PFEIU,PHEIU,IARBN,RJAVW
3020 DATA SABWX,LTUDQ,UADMZ,GMPSL,LRUXY,SYBKF
3030 DATA LRMDY,QNRID,XUMPK,LIADP
4000 DATA A,BY,IS,IN,OF,CAN,YOU,THE,TWO
4010 DATA EYES,FROM,LIFE,NAME,PEER,WENT,YOUR
4020 DATA BOOKS,CRACK,CRATE,GUESS,LATER
4030 DATA BESIDE,EHRICH,HAVING,NAILED
4040 DATA ESCAPED,SECONDS,THROUGH,STANDING,SUDDENLY
5000 DATA 12,16,30,3,20,6,18,21,7,19,2,29
5010 DATA 23,25,5,31,24,9,1,26,32,28,13,10,27
5020 DATA 21,2,8,9,22,10,15,25,17,4,23,6,14

```

Commodore 64 & 128 (C 64 mode)/Passwords to Ponder

```

10 DIM WD$(22),Z$(32),PT(38),RC(22)
20 SW=40:TM=4:BM=21:PRINT CHR$(5);CHR$(8);CHR$(142)
30 CL$=CHR$(147):ALL=0:FOR X=1 TO 22:RC(X)=0
40 READ WD$(X):NEXT X:SP$=CHR$(32)
50 RC(1)=2:RC(22)=2:Z$(1)=",":Z$(2)=".":Z$(3)=SP$
60 FOR X=3 TO 32:READ Z$(X):NEXT X
70 FOR X=1 TO 38:READ PT(X):NEXT X
80 D$=Z$(11):FOR X=1 TO 38
90 IF PT(X)>2 THEN D$=D$+SP$
100 D$=D$+Z$(PT(X)):NEXT X:D$=D$+"?"
110 FOR X=1 TO 5
120 T=INT(RND(1)*20)+2:IF RC(T)<>0 THEN 120
130 RC(T)=1:NEXT X

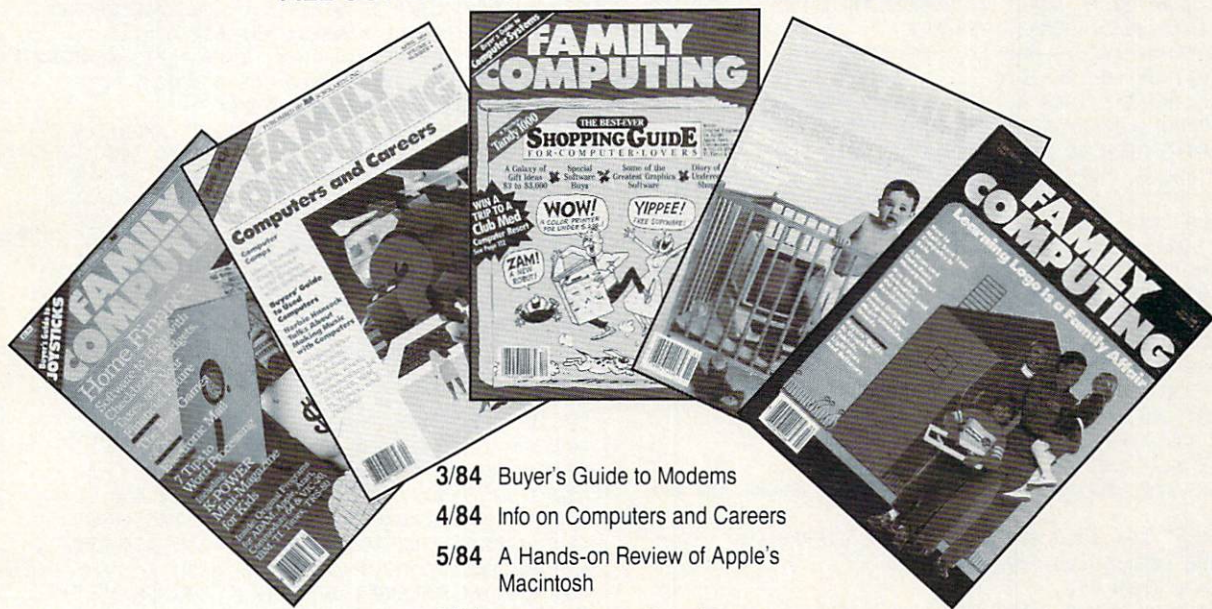
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```

140 FOR X=1 TO 22:TS="":AS=WD$(X)
150 V=ASC(LEFT$(AS,1))-64:FOR Y=2 TO LEN(AS)
160 N=ASC(MID$(AS,Y,1))-V
170 TS=TS+CHR$(N-26*(N<65)):NEXT Y
180 WD$(X)=TS:NEXT X
190 PRINT CLS;NS="PASSWORDS TO PONDER":GOSUB 1000
200 PRINT:MS="WHAT PLACE ON APPLECREEK ROAD WOULD"
210 MS=MS+" YOU LIKE TO VISIT?":GOSUB 2000:PRINT
220 MS="(TYPE THE NUMBER, <H> FOR A HINT,"
230 MS=MS+" OR <Q> TO QUIT; THEN PRESS <RETURN>.)"
240 VP=BM:HP=0:GOSUB 3000:GOSUB 2000
250 VP=TM:HP=0:GOSUB 3000:NUMS=""
260 INPUT "NUMBER";NUMS:IF NUMS="" THEN 250
270 PRINT CLS;NUM=VAL(NUMS):IF NUM<>0 THEN 370
280 KS=LEFT$(NUMS,1)
290 IF KS="Q" THEN PRINT CHR$(9);:END
300 IF KS<>"H" THEN 190
310 FOR Y=1 TO 11:FOR X=1 TO 2
320 V=Y+(X-1)*11:HP=SW-SW/X
330 VP=Y-1:GOSUB 3000:PRINT V*2+99
340 IF RC(V)<2 THEN 360
350 HP=HP+5:GOSUB 3000:PRINT WD$(V)
360 NEXT X:NEXT Y:GOSUB 5000:GOTO 190
370 NUM=NUM-100:IF NUM<1 OR NUM>43 THEN 190
380 IF INT(NUM/2)=NUM/2 THEN 190
390 NUM=(NUM+1)/2:IF NUM=22 THEN 600
400 IF RC(NUM)=0 THEN 470
410 IF RC(NUM)=1 THEN RC(NUM)=3:GOTO 440
420 MS="YOU ALREADY KNOW THAT THE PASSWORD"
430 MS=MS+" HERE IS "+WD$(NUM)+".":GOTO 460
440 NS="HELLO, MOTHER.":GOSUB 1000
450 MS="THE PASSWORD HERE IS "+WD$(NUM)+".":
460 GOSUB 2000:GOSUB 5000:GOTO 540
470 MS="HELLO, MRS. WEISS! WHAT DO YOU THINK"
480 MS=MS+" MY SECRET PASSWORD IS?":GOSUB 2000
490 PRINT:PASS$="":INPUT PASS$:PRINT CLS;
500 IF PASS$=WD$(NUM) THEN 530
510 NS="SORRY, YOU'RE WRONG!":GOSUB 1000
520 GOSUB 5000:GOTO 190
530 NS="YOU GUESSED IT!":GOSUB 1000:GOSUB 5000
540 PRINT CLS;RC(NUM)=2:ALL=-1
550 FOR X=2 TO 21:IF RC(X)<2 THEN ALL=0:X=21
560 NEXT X:IF NOT ALL THEN 190
570 PRINT CLS;MS="YOU NOW KNOW EVERY PASSWORD AND CAN"
580 MS=MS+" GET YOUR SURPRISE AT THE LIBRARY."
590 GOSUB 2000:GOSUB 5000:GOTO 190
600 IF ALL THEN 640
610 MS="SORRY! YOU CAN'T GET YOUR SURPRISE UNTIL"
620 MS=MS+" YOU KNOW ALL THE PASSWORDS."
630 GOSUB 2000:GOSUB 5000:GOTO 190
640 FOR DE=1 TO 500:NEXT DE
650 MS=D$:GOSUB 2000:PRINT CHR$(9);:END
1000 IF LEN(NS)=SW THEN PRINT NS;:RETURN
1010 PRINT SPC((SW-LEN(NS))/2);NS;:RETURN
2000 IF LEN(MS)<=SW THEN NS=MS:GOSUB 1000:RETURN
2010 Y=SW+1:Z=1:FOR X=Y TO 2 STEP -1
2020 IF MID$(MS,X,1)=SP$ THEN Z=0:Y=X:X=2
2030 NEXT X:PRINT LEFT$(MS,Y-1);:IF Y-1<SW THEN PRINT
2040 MS=RIGHT$(MS,LEN(MS)-Y+2):GOTO 2000
3000 POKE 214,VP:PRINT:PRINT SPC(HP);:RETURN
5000 VP=BM:HP=0:GOSUB 3000
5010 MS="PRESS ANY KEY TO CONTINUE.":GOSUB 2000
5020 GET K$:IF K$="" THEN 5020
5030 RETURN
6000 DATA YANNJ,PREEJ,SUHTM,GILHA,PRUBJ,SIXEM
6010 DATA KAPDE,TJLMN,PFEIU,PHEIU,IARBN,RJAVW
6020 DATA SABWX,LTUDQ,UADMZ,GMPSL,LRUXY,SYBKF
6030 DATA LRMDY,QNRID,XUMPK,LIADP
7000 DATA A,BY,IS,IN,OF,CAN,YOU,THE,TWO
7010 DATA EYES,FROM,LIFE,NAME,PEER,WENT,YOUR
7020 DATA BOOKS,CRACK,CRATE,GUESS,LATER
7030 DATA BESIDE,EHRICH,HAVING,NAILED
7040 DATA ESCAPED,SECONDS,THROUGH,STANDING,SUDDENLY
8000 DATA 12,16,30,3,20,6,18,21,7,19,2,29
8010 DATA 23,25,5,31,24,9,1,26,32,28,13,10,27
8020 DATA 21,2,8,9,22,10,15,25,17,4,23,6,14

```

IBM PC & compatibles*/Passwords to Ponder

```

10 SCREEN 0,0:KEY OFF
20 DIM WD$(22),Z$(32),PT(38),RC(22)
30 SW=80:DL=800:TM=5:BM=22:WIDTH SW
40 ALL=0:FOR X=1 TO 22:RC(X)=0
50 READ WD$(X):NEXT X:SP$=CHR$(32)
60 RC(1)=2:RC(22)=2:Z$(1)="",":Z$(2)=",":+SP$
70 FOR X=3 TO 32:READ Z$(X):NEXT X
80 FOR X=1 TO 38:READ PT(X):NEXT X
90 D$=Z$(11):FOR X=1 TO 38
100 IF PT(X)>2 THEN D$=D$+SP$
110 D$=D$+Z$(PT(X)):NEXT X:D$=D$+"?"
120 FOR X=1 TO 5
130 T=INT(RND*20)+1:IF RC(T)<>0 THEN 130
140 RC(T)=1:NEXT X
150 FOR X=1 TO 22:TS="":AS=WD$(X)
160 V=ASC(LEFT$(AS,1))-64:FOR Y=2 TO LEN(AS)
170 N=ASC(MID$(AS,Y,1))-V
180 TS=TS+CHR$(N-26*(N<65)):NEXT Y
190 WD$(X)=TS:NEXT X
200 CLS;NS="PASSWORDS TO PONDER":GOSUB 1000:PRINT
210 MS="WHAT PLACE ON APPLECREEK ROAD WOULD YOU"
220 MS=MS+" LIKE TO VISIT?":GOSUB 2000:PRINT
230 MS="(TYPE THE NUMBER, <H> FOR A HINT,"
240 MS=MS+" OR <Q> TO QUIT; THEN PRESS <ENTER>.)"
250 VP=BM:HP=1:GOSUB 3000:GOSUB 2000
260 VP=TM:HP=1:GOSUB 3000:NUMS=""
270 INPUT "NUMBER";NUMS:IF NUMS="" THEN 260
280 CLS:NUM=VAL(NUMS):IF NUM<>0 THEN 380
290 KS=LEFT$(NUMS,1):GOSUB 4010
300 IF KS="Q" THEN END
310 IF KS<>"H" THEN 200
320 FOR Y=1 TO 11:FOR X=1 TO 2
330 V=Y+(X-1)*11:HP=SW-SW/X+1
340 VP=Y+1:GOSUB 3000:PRINT V*2+99
350 IF RC(V)<2 THEN 370
360 HP=HP+5:GOSUB 3000:PRINT WD$(V)
370 NEXT X:NEXT Y:GOSUB 5000:GOTO 200
380 NUM=NUM-100:IF NUM<1 OR NUM>43 THEN 200
390 IF INT(NUM/2)=NUM/2 THEN 200
400 NUM=(NUM+1)/2:IF NUM=22 THEN 640
410 IF RC(NUM)=0 THEN 480
420 IF RC(NUM)=1 THEN RC(NUM)=3:GOTO 450
430 MS="YOU ALREADY KNOW THAT THE PASSWORD"
440 MS=MS+" HERE IS "+WD$(NUM)+".":GOTO 470
450 NS="HELLO, MOTHER.":GOSUB 1000
460 MS="THE PASSWORD HERE IS "+WD$(NUM)+".":
470 GOSUB 2000:GOSUB 5000:GOTO 580
480 MS="HELLO, MRS. WEISS! WHAT DO YOU THINK"
490 MS=MS+" MY SECRET PASSWORD IS?":GOSUB 2000
500 PRINT:TS="":INPUT TS:CLS
510 LT=LEN(TS):IF LT=0 THEN 550
520 PASS$="":FOR X=1 TO LT:K$=MID$(TS,X,1)
530 GOSUB 4010:PASS$=PASS$+K$:NEXT X
540 IF PASS$=WD$(NUM) THEN 570
550 NS="SORRY, YOU'RE WRONG!":GOSUB 1000
560 GOSUB 5000:GOTO 200
570 NS="YOU GUESSED IT!":GOSUB 1000:GOSUB 5000
580 CLS:RC(NUM)=2:ALL=-1
590 FOR X=2 TO 21:IF RC(X)<2 THEN ALL=0:X=21
600 NEXT X:IF NOT ALL THEN 200
610 CLS:MS="YOU NOW KNOW EVERY PASSWORD AND CAN"
620 MS=MS+" GET YOUR SURPRISE AT THE LIBRARY."
630 GOSUB 2000:GOSUB 5000:GOTO 200
640 IF ALL THEN 680
650 MS="SORRY! YOU CAN'T GET YOUR SURPRISE UNTIL"
660 MS=MS+" YOU KNOW ALL THE PASSWORDS."
670 GOSUB 2000:GOSUB 5000:GOTO 200
680 FOR DE=1 TO DL:NEXT DE
690 MS=D$:GOSUB 2000:END
1000 IF LEN(NS)=SW THEN PRINT NS;:RETURN
1010 PRINT TAB((SW-LEN(NS))/2);NS;:RETURN
2000 IF LEN(MS)<=SW THEN NS=MS:GOSUB 1000:RETURN
2010 Y=SW+1:Z=1:FOR X=Y TO 2 STEP -1
2020 IF MID$(MS,X,1)=SP$ THEN Z=0:Y=X:X=2
2030 NEXT X:PRINT LEFT$(MS,Y-1);:IF Y-1<SW THEN PRINT

```


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LOGON, page 82
DR. KURSORS KLINIC, page 83
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K-Power Contest
Page 88

Edited by Anne Krueger

POK POWER[®]

FOR THE COMPUTER GENERATION

Programming Tips and Tricks from a Pro

Here's some programming advice from Gabrielle Savage, a software artist with Tom Snyder Productions (TSP). Gabrielle designed *Swiss Family Robinson* (Windham Classics/Spinnaker) and *Spelldiver* (Scholastic), and contributed to other TSP creations.

1. Develop your own programming style. Clean, neat code is easier to read, debug, and modify than spaghetti code that branches all over the place in a tangled mess. It's possible to write either an incredibly messy program or an elegant, impeccable program that does the same thing. But try to show the messy one to someone and expect her or him to know what's going on (or try to go back to it yourself later) and you've got some problems!

2. Learn to write modular programs. This means structuring your code into distinct modules or groups of subroutines that act independently of other modules. That way, you can write a module that does a particular task and debug it until you're confident it works; you may never need to look at that code again! Simply call the subroutines that perform the task.

Knowing when to make a section of code into a subroutine is important. A big clue is if you find yourself duplicating code already written. If a routine is getting so long you're afraid to change one part of it because you're not sure what else might be affected, it might be time to neaten it up a bit. Isolate chunks of code that do specific, involved tasks by making them into subroutines, and give them descriptive names, such as DRAWBOX or PROMPTUSER.



3. Use meaningful comments. In places where the programming language itself doesn't really explain what is going on at a glance, add comments to fill in the gaps. You shouldn't have a lot of meaningless numbers scattered about your program. Use constants whenever you want to type a number. #CHARS.PER.LINE, for example, is a lot more meaningful than #40.

4. Be specific. Put notes or comments at the start of each subroutine that tell what input the subroutine expects, what output it produces, and a short description of what it does (if that's not obvious from its name). Many bugs are born when programmers rely solely on their memory for the specifics of subroutines they've written.

5. Rub elbows with people in the computer field. Never be too shy to ask someone about her or his job. Be sure to ask a large sampling of people; don't make the mistake of thinking one person's opinion represents the opinions of everyone in that field. Seek out people who hold jobs you think you might like to have some day.

You might try to get a part-time job or internship in the computer field. Even if you're just testing unreleased products and not programming, you'll pick up a lot of useful information and make contacts.

—ANN E. LAFORGE

Software Scoop!

Are you ready for *Rogue*? With *Rogue*, the computer gamer never plays the same game twice. That's *Epyx*' promise about this new adventure, role-playing strategy game for IBM computers and planned for Mac (\$29-\$39). The gamer's goal is to fight through 26 levels of monster-filled Dungeons of Doom in quest of the enchanted Amulet of Yendor. Each time *Rogue* is played, the dungeon rooms and monsters confronting the player are different! . . . Look for three new products from **Activision** on store shelves now. In *Alcazar*:

The Forgotten Fortress (Apple II series, \$39.95; C 64, \$29.95), designed by **Tom Loughry**, you encounter griffins, genies, man-eating tigers, and other meanies en route to the jeweled throne of Alcazar. An interesting auditory quirk: You can hear danger ahead! In another new Activision release, you're behind the wheel and plot your own course in **Al Demo's The Great American Cross Country Road Race** (Atari, \$24.95; C 64, \$29.95). In still another, you and your Android Crisis Team (ACT) must find and repair a faulty power core before it's too late. The name of that one: **Countdown to Shutdown** (C 64, \$29.95). . . .

Do You Have Computer Trivia Power?!

show us their computer trivia power (March, page 72), we had no idea what a tough challenge we were presenting! Our two winners, Joel Simon of Lancaster, Pennsylvania (13), and Matthew Connarton of Concord, New Hampshire (12), each won Suncom's *PQ: The Party Quiz Game* for their contest efforts. Joel got four out of eight answers correct; Matthew hit on two.

Here are the contest questions for anyone who'd like to take another crack at it. You'll find the answers below.

1. What are the names of the famous sidekicks in Infocom's *Planetfall* and Trillium's *Amazon*?



Joel Simon

2. What does BASIC really stand for?

3. What is the full name of the woman who has a computer language named after her? And what was her part in computing history?

4. Which word means "a sloppy computer program": Baud, buffer, kluge, or deuce?

5. What do the designers at Ozark Softscape (they designed *M.U.L.E.*) do to brainstorm for ideas?

6. Why did the designers at Atari build in a feature that automatically changes the screen color after a certain amount of time?

7. Who wrote and recorded that great song "BASIC Ain't the Language of Love"?

8. Who is this guy?



Computer-Aided Chocolate Biz

What started out as a love of chocolate has turned into a profitable chocolate-making business for 17-year-old Kimberly Merritt of Cumberland, Maryland. Called Kim's Khocolate Korner, business has boomed (Kim sold 18,000 chocolate bars in one fund-raising drive at high school!) and Kim has had to add inventory. "I now have 300 molds, and a variety of chocolates as well as caramels, fudge, pecan turtles, and chocolate-chip cookies," Kim says. Another addition to her business: an Apple IIc, ImageWriter printer, and mouse.

Kim decided to buy a computer because she thought it would help her get organized and reduce her paperwork. "Now," she says, "I couldn't imagine running my business with-

out one!"

Much of Kim's business comes to her via word of mouth and direct mail. She has a preferred-customer mailing list of about 200 "faithfuls." They receive flyers about holiday specials and new product announcements that Kim makes herself



Kim's love for chocolate got her business started but her computer keeps it going.

with Broderbund's *Print Shop* software. Apple's *AppleWorks* is another program Kim uses to keep track of orders and inventory. She eventually hopes to use her IIc for all accounting and tax-record purposes.

Computers haven't just helped Kim's business, they've given her an idea for a surefire campaign. Kim made computer-shaped chocolate for a fund-raiser for her sister's computer club. According to Kim, "It probably was one of the most successful fund-raisers I ever did! Three thousand pieces were sold almost instantly, and the club earned enough money to purchase a new Apple computer!" Always the entrepreneur, she adds, "If Steve Jobs reads this article, I want him to know that I would love to make Apple chocolates. I bet they'd be big sellers!"

—SUZETTE HARVEY

LOGON

FLIPPED OVER "FLIPPY"

As computer enthusiasts operating on shoestring budgets, we were delighted to learn that we could turn a single-sided disk into a "flippy" by cutting a write protection notch (Dr. Cursor's Clinic, April K-POWER).

We would like to make a correction to one of the statements made in your article. The Apple II family of computers uses a single-sided, single-density format system. This particular setup writes to the bottom side of the disk. Should the disk producer find a flaw on a disk, the flaw side would be put on the top, not the bottom. This applies to any

single-sided disk system, as far as we know.

This may seem a trivial point to correct but some of your readers may have interpreted your article as saying that the bottom of the disk contains no information. This may lead some computer users to inadvertently abuse the true operating side of their disks.

The track-sync hole isn't used on Apple or Apple-compatible drives. Instead, track-sync is set by a series of bytes in the track header.

4-H COMPUTER CLUB
Garfield County
Parachute, Colorado

ANSWERS:

1. Floyd and Pao.
2. Beginner's All-purpose Symbolic Instructional Code.
3. Lady Ada Lovelace (the language is called Ada). She worked with Charles Babbage to invent the Analytical Engine. She's considered the first computer programmer.
4. Kluge.
5. They go fishing (it says so on the M.U.L.E. package).
6. To prevent a screen image from being permanently etched on the screen.
7. Country-western recording artists Steve and Debby Brown.
8. Apple's infamous Steve Wozniak, of course!

DOCTOR KURSOR'S KLINIC

How can I get my computer to display foreign characters?

DR. KURSOR: With a little programming, you can rig up your computer to display a foreign character, a backwards "E," or a little picture whenever you press a certain key. Depending on your computer, you'll be able to generate your own secret codes, do your French class homework on your computer, or make programming certain games a lot easier. Here's how:

Some computers' "character sets" are more flexible than others. All micros store the patterns of dots that make up each letter on a ROM chip. But you can tell Commodores and Ataris to look for those patterns in RAM instead, and put your own dot patterns into memory.

On systems with hi-res graphics modes, you can turn each individual screen dot on or off, so you can draw any shape or size of letter on the screen. This is a slow and painful process unless you program in machine language or buy a character-drawing program that does the work for you.

"Character-editor" or "font-editor" programs make creating your own characters easier. The disadvantage of designing your own is that most software packages will use your computer's built-in characters, not your redesigned letters.

But suppose you have a TRS-80 Model III or 4, or a monochrome IBM PC. These computers don't offer hi-res graphics unless you buy an extra circuit board. So you can either change the ROM chip that holds the dot patterns or settle for the built-in characters. But that's not so bad! Built into the IBM, like the Atari XLs and XEs, are those



special accented characters you need for most European languages, plus some Greek letters. And the TRS-80 has all that, plus Japanese Kana characters!

For true flexibility, though, no other micro beats the Macintosh. After all the complaints by Apple II users that they couldn't change the character set, Apple designed the Mac with multiple "fonts," or typefaces. To use a new font, you just load it in from disk! Designing your own is easy, too.

What's that? You want to *print* in German, too? That takes a matched combo of hardware and software.

You can get foreign-language daisies for daisywheel printers; and some dot-matrix printers can print foreign characters. Your software has to send the right codes to these printers to make those characters print.

Dot-matrix printers designed to work with Commodores, Ataris, or IBMs often come with that computer's special characters, so printing them out is easy. The ADAM's printer, though, doesn't print all the characters the ADAM can display.

With screen-dump software and a dot-matrix printer with graphics capability, you can print characters you've drawn on a hi-res screen. Macs come with this software and a compatible printer.

Some dot-matrix printers can actually be programmed to print us-

ing a character set you've designed. Check the manual to find out how.

How do you get the numbers that go into DATA statements?

DR. KURSOR: DATA statements can hold just about any kind of info a program needs.

In Microtones programs, they usually give the pitch and duration of each note, taken from manuals.

In our graphics programs, DATA statements may contain the starting and ending points of lines to be drawn on the screen.

In puzzles, the DATA may be text that's been coded so you can't understand it as you're typing it in.

DATA statements are an easy way to put machine-language routines or "pictures" of sprites into a BASIC program.

If you don't want to set up a separate file on disk or cassette to hold your program's data—your friends' names and phone numbers, say—you can store them right in the program using DATA statements.

As you can see, there are as many uses for DATA statements as there are kinds of programs.

We use them to avoid having to INPUT the same data every time a program is run—and because they're easier to change and more manageable than long strings of assignment statements like

A(1)=23:A(2)=45:A(3)=57:A(4)=32:...

ILLUSTRATION BY SAM VIZIANO

STRATEGY

TIPS, TRICKS, AND HINTS

INDIANA JONES IN THE LOST KINGDOM

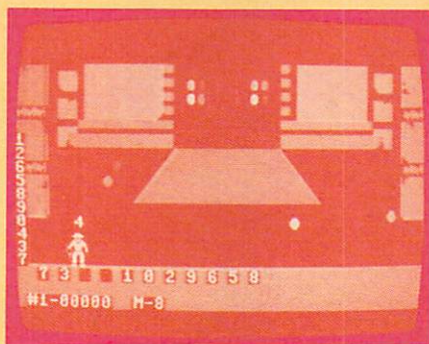
Mindscape. Arcade/strategy. Your mission: Ever dreamt of being Indiana Jones? This gives you the chance of casting players

as the famous adventurer and his arch-rival Ivan Reiss. In six separate scenarios, gamers must solve exotic puzzles and evade deadly ene-

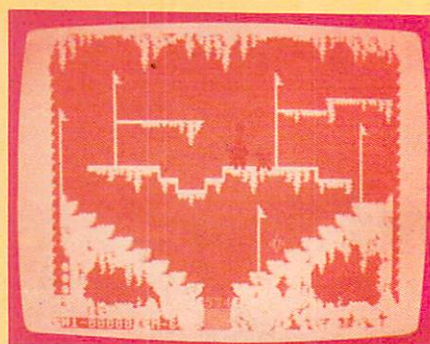
mies in order to find an invaluable historical relic. (Hints and game for C 64.)



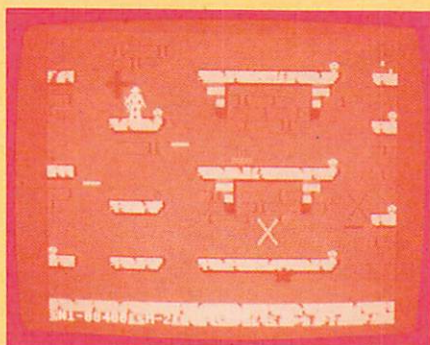
Screen one: Take the color from the blue balls on the left and give it to the white ones on the right.



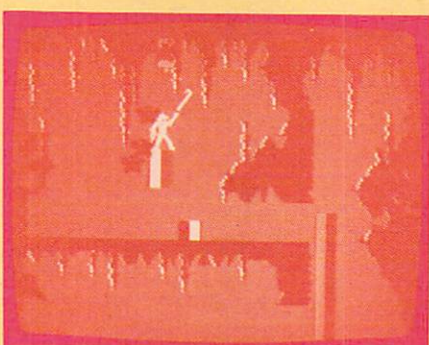
Screen two: You must arrange the numbers on the bottom of the screen so they read from left to right as they do from bottom to top.



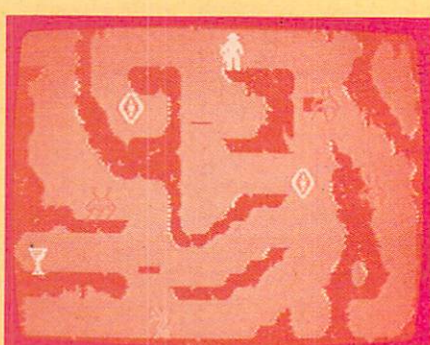
Screen three: Pick up the numbers and drop them into the abyss at the bottom of the screen. A black ball at the left indicates a correct choice.



Screen four: Hit the jewels with the cane to make them change color (white cane for white diamond, blue for blue). They must be in the order blue-white-blue.



Screen five: How do you stop a big green monster from charging? Take away its credit card. Or, if you are Indiana Jones, slash at it with your magic walking stick. In this game, the latter method works best.



Screen six: Pull back on the joystick and press the button to teleport around. Be careful, though, since you have a limited amount of teleports. —PHILIP CARDINALE, 11, Riverhead, New York; CHARLES ARDAL, 14, New York, New York

ADVENTURELAND

Adventure International. Text adventure. Your mission: You must contend with a dragon, a bear, lava, and bees, among other things, and get the 13 treasures scattered across the land. (Hints and game for Apple, Atari, Commodore 64 & VIC-20, TRS-80 CoCo & Models I/III.)

Dragons take pride in their cleanliness. Having dirty stuff around makes them very angry.

The bear is really a coward at

heart. He is especially afraid of loud noises.

Bees in flight are a dragon's fright.

The mirror is extraordinarily fragile. Only place it on soft items.

Fire bricks can be a dam good thing.

The wine bladder is meant to hold a more gaseous substance.

You've heard of a ship in a bottle? Why not try fish in a bottle?

Water makes an excellent coolant.

Chigger bites getting you down? Mud might help you out. —KENNY SMITH, 12, Hanover, Pennsylvania; MICHAEL OTTAVIANO, 12, Grand Forks, North Dakota; DAVID LAKE, San Jose, California; JOHN TSAU, 14, Skokie, Illinois; CHRIS TWENTIER, 12, Prospect, Pennsylvania

SUSPECT

Infocom. Text adventure. Your mission: As the prime suspect of Veronica Ashcroft's murder, you must prove your innocence and find the real murderer. You'll need all your wits and intuition about you in order to complete this mystery in the mere 12 hours allotted you. Happy sleuthing! (Hints and game for most computers.)

❖ Don't bother trying to hide Veronica's corpse. You can carry it anywhere in the game, but Sergeant Duffy will find it, regardless of where you stash it.

❖ On the other hand, feel free to search the body and remove any

incriminating evidence from the scene of the crime; this may not do you much good right away, but will buy you some time in the long run.

❖ One of the best ways to make the detective think twice about arresting you is to place suspicion on others. Try showing him some pieces of evidence that you find—if you find enough important clues he'll let you off the hook.

❖ When you last see "Veronica" alive, examine her closely.

❖ Clues can be found in the oddest places—trash cans and locked car trunks, for instance.

❖ Take heed of Alicia's wet overcoat. There is something vitally important about its soggy condition.

❖ Be patient with the detective; he may be slow to respond at the beginning of the game, but remember you're his chief suspect. Just wait till you convince him that you are not only innocent but on the trail of the real killer; suddenly he'll be quite willing to help.

❖ One of the first things to do is to make a list of the characters and their costumes. It's all too easy to forget who was dressed as what. —CHARLES ARDAI, 14, New York, New York

H I N T H O T L I N E

RAID OVER MOSCOW. Access Software (Commodore 64). Arcade/strategy. Your mission: To save the United States from a Soviet nuclear attack by destroying their launch sites. If you are successful in this, you must invade Moscow in an attempt to destroy the Soviet Defense Center.

❖ When fighting at the missile control center, destroy the four launch silos first. Then, find the correct altitude for the main silo, but don't destroy it. Instead, go to the extreme left, without changing altitude, and blow up the planes as they enter the screen. Keep killing them until you have about 10 seconds left on the timer, and destroy the center silo. This will give you tons of points.

❖ When fighting outside the Defense Center, the men on the right wall can be hit using the same angles of elevation as those on the left wall. When you kill a man on one side, don't change your angle, just move over to the other side and kill the man directly opposite him.

—SPECIAL KS

CHAMPIONSHIP LODE RUNNER.

Broderbund (Apple). Arcade/skill. Your mission: To climb through the 50 different screens and collect all the gold you can get your greedy little hands on.

❖ If you have *Lode Runner*, boot it up, then start the game, take out the disk, and insert the *Championship Lode Runner* disk. You can now skip levels on *Championship Lode Runner* by typing CONTROL-SHIFT-6 on the Apple IIe and IIc, and by pressing CONTROL-SHIFT-N on the II plus. You can also get extra men by pressing CONTROL-SHIFT-2 on the IIe and IIc, and by pressing CONTROL-SHIFT-P on the II plus. —OSCAR LEE, 13, San Francisco, California

CUTTHROATS. Infocom (most computers). Text adventure. Your mission: As a diver, you must try to find sunken treasure on the many shipwrecks strewn about Hardscrabble Isle.

❖ If the time on the status line stops, try examining your watch.

❖ To get by the METAL mine try using an attractive force.

❖ Whatever you do, don't let McGinty see you with the bankbook or the shipwreck book. Get rid of them both when you can.

❖ Drinking and diving don't mix.

❖ Only stay in the squid room for one turn; if you do it's harmless.

❖ Much of the equipment at Outfitters International is unnecessary. Think carefully. —JERRY FOSTER, 17, Three Rivers, Michigan

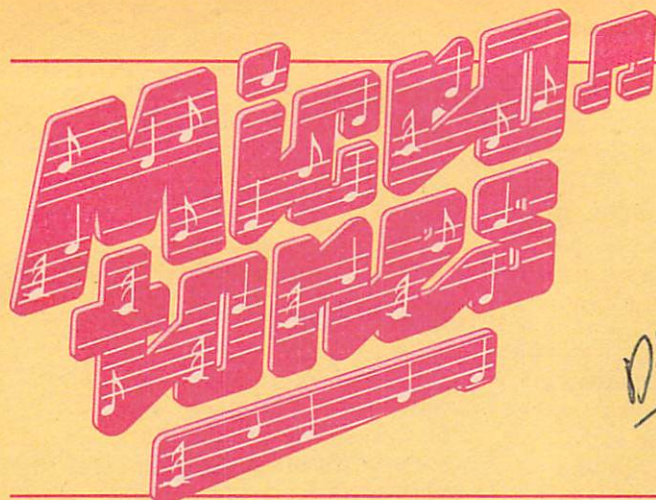
CANNONBALL BLITZ. On-line Systems (Apple). Skill/arcade. Your mission: Avoid cannons and climb ladders in this *Donkey Kong*-type game.

❖ Immediately after clearing the first level, hold down the space bar and the second level will only start with one cannon. —ZACHARY PRENSKY, 12, Fairlawn, New Jersey

BEACH-HEAD. Access Software (C 64). Arcade skill. Your mission: To invade a well-defended, enemy-held island, and kill the evil Khun-Lin.

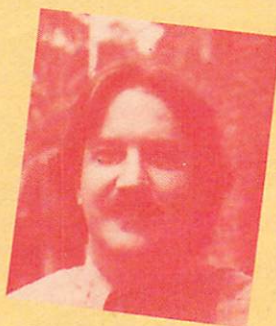
❖ When fighting the land-defense systems, if you shoot an enemy tank, tower, or gun emplacement, the point value for that object is displayed. If you keep shooting these numbers, you will continue to get that amount of points. Be careful, though, because you can be destroyed by crashing into the numbers. —JEROME GOEMAAT, 12, Bussey, Iowa

We're looking for a few good hints! Help K-POWER readers be all that they can be by sending us hints for your favorite games. We have all the *Zork* and *Pac-Man* hints we can handle, but we'll be glad to publish and pay \$10 for hints we've not heard of. Send them to Hint Hotline, c/o K-POWER, 730 Broadway, New York, NY 10003. (Note: the computer systems listed in brackets indicate the computer versions the hints work for.)



MUSIC PROGRAMS BY JOEY LATIMER

Arcades bring back memories of bleeps, blips, zooming aliens, and high scores for many of us who hung around rapping and zapping in the local shopping mall or at the miniature golf course. A few years back, arcades were crawling with trigger-happy fans. They're pretty quiet and dusty these days as more computers show up at home.



For those of us who left our local arcade alley for the home computer, here's a nostalgic audio look at the arcade alley of the early '80s. With the help of lab assistant Ken Meyer, I've assembled a program (dubbed *Arcade Alley*, appropriately enough!) that plays a song and arcade sounds. Run the program as is or use it to beef up your own programs. No matter how you use it, we're sure you'll enjoy it. It may even bring back memories of that time you scored in the top 10.



ATARI 400, 800, 600/800XL, & 130XE/ ARCADE ALLEY

```
10 DIM BN(7,2),TN(25):C1=-8:POKE 752,1
20 PRINT CHR$(125):POSITION 13,10:PRINT "ARCADE ALLEY"
30 FOR I=1 TO 7:READ A,B:BN(I,1)=A:BN(I,2)=B:NEXT I
40 FOR I=1 TO 25:READ A:TN(I)=A:NEXT I
50 FOR Z=1 TO 2:P1=1:FOR I=1 TO 25
60 IF RND(1)>.5 THEN C1=INT(RND(1)*15)-8
70 SOUND 1,BN(P1,1),10,10:SOUND 2,TN(I),10,8
80 FOR D=1 TO BN(P1,2)
90 SOUND 3,ABS(C1)/2,10,4:C1=C1+8:NEXT D
100 P1=P1+1:IF P1=8 THEN P1=1
110 NEXT I
120 SOUND 3,INT(RND(1)*70),8,15:FOR D=1 TO 350:NEXT D
130 SOUND 3,0,0,0:NEXT Z:FOR X=243 TO 29 STEP -1
140 SOUND 1,X-5,10,12:SOUND 2,X,10,12:NEXT X
150 GOTO 50
1000 DATA 243,7,217,7,193,7,182,13,144,7,243,20,182,20
2000 DATA 60,60,60,53,72,91,72,60,60,60,60,81,72
2010 DATA 121,60,60,53,72,91,72,60,60,60,53,72
```



COMMODORE 64 & 128 (C 64 MODE)/ ARCADE ALLEY

```
10 DIM BN(7,3),TN(25,2):C1=75:S=54272
20 PRINT CHR$(147):POKE 214,10:PRINT
30 PRINT TAB(13);"ARCADE ALLEY"
40 FOR I=S TO S+23:POKE I,0:NEXT I:POKE S+24,15
50 FOR I=S+6 TO S+7
60 POKE I,128:POKE I+7,128:POKE I+14,128:NEXT I
70 FOR I=1 TO 7:READ BN(I,1),BN(I,2),BN(I,3):NEXT I
80 FOR I=1 TO 25:READ TN(I,1),TN(I,2):NEXT I
90 POKE S+4,33:POKE S+11,33
100 FOR Z=1 TO 2:POKE S+18,17:P1=1:FOR I=1 TO 25
110 IF RND(1)>.5 THEN C1=RND(1)*75
120 POKE S+1,BN(P1,1):POKE S,BN(P1,2)
130 POKE S+8,TN(I,1):POKE S+7,TN(I,2)
140 FOR D=1 TO BN(P1,3)
150 POKE S+15,C1:C1=C1-4-75*(C1<4):NEXT D
160 P1=P1+1:IF P1=8 THEN P1=1
170 NEXT I
180 POKE S+15,15:POKE S+18,129
190 FOR D=1 TO 500:NEXT D
200 POKE S+18,0:NEXT Z:FOR X=8 TO 80
210 POKE S+1,X-2:POKE S+8,X:FOR D=1 TO 2
220 NEXT D,X
230 GOTO 100
1000 DATA 8,97,7,9,104,7,10,143,7,11,48,13
1010 DATA 14,24,13,8,97,20,11,48,20
2000 DATA 33,135,33,135,33,135,37,162,28,49,22,96
2010 DATA 28,49,33,135,33,135,33,135,33,135,25,30,28
2020 DATA 49,16,195,33,135,33,135,37,162,28,49,22,96
2030 DATA 28,49,33,135,33,135,37,162,28,49,28,49
```



TI-99/4A/ARCADE ALLEY

```
10 DIM BN(7,2),TN(25)
20 CALL CLEAR
30 PRINT TAB(9);"ARCADE ALLEY"
40 FOR I=1 TO 7
50 READ BN(I,1),BN(I,2)
60 NEXT I
70 FOR I=1 TO 25
80 READ TN(I)
90 NEXT I
100 FOR Z=1 TO 2
110 P1=1
120 FOR I=1 TO 25
130 CALL SOUND(BN(P1,2),BN(P1,1),0,TN(I),5)
140 P1=P1+1+7*(P1=7)
150 NEXT I
160 CALL SOUND(1000,-5,0)
170 NEXT Z
180 FOR D=1 TO 300
190 NEXT D
200 FOR X=130 TO 600 STEP 15
210 CALL SOUND(-500,X,0,X-10,0)
220 NEXT X
230 GOTO 100
1000 DATA 131,150,147,150,165,150,175,300
1010 DATA 220,150,131,450,175,450
2000 DATA 523,523,523,587,440,349,440,523,523
2010 DATA 523,523,392,440,262,523,523,587
2020 DATA 440,349,440,523,523,523,587,440
```




VIC-20/ARCADE ALLEY

```

10 DIM BN(7,2),TN(25):C1=254:S=36874
20 PRINT CHR$(147):POKE 214,10:PRINT
30 PRINT TAB(5);"ARCADE ALLEY"
40 POKE S+4,15
50 FOR I=1 TO 7:READ BN(I,1),BN(I,2):NEXT I
60 FOR I=1 TO 25: READ TN(I):NEXT I
70 FOR Z=1 TO 2:P1=1:FOR I=1 TO 25
80 IF RND(1)>.5 THEN C1=INT(RND(1)*20)+234
90 POKE S,BN(P1,1):POKE S+1,TN(I)
100 FOR D=1 TO BN(P1,2)

```

```

110 POKE S+2,ABS(C1):C1=C1-3-128*(C1<131)
120 NEXT D:P1=P1+1:IF P1=8 THEN P1=1
130 NEXT I
140 POKE S+3,INT(RND(1)*80)+170:FOR D=1 TO 350:NEXT D
150 POKE S+3,0:NEXT Z:FOR X=128 TO 225
160 POKE S+2,X:POKE S+1,X+25:FOR D=1 TO 3
170 NEXT D,X
180 GOTO 70
1900 DATA 223,7,227,7,229,7,232,14,236,7,223,21,232,21
2000 DATA 239,239,239,241,236,231,236,239,239,239,239
2010 DATA 233,236,223,239,239,241,236,231,236
2020 DATA 239,239,239,241,236

```

M I C R O N O T E S

Are computers your vice? Have you thought of their connection to the hit TV show "**Miami Vice**?" Each segment of the NBC show includes some 20 minutes of music that rock/jazz musician **Jan Hammer**, 37, scores with the help of a **Fairlight CMI** synthesizer.

Asked how he creates the computerized music, Hammer said, "The connotation when you hear 'computer music' is that it will be game-show music with bleeps and buzzers. I'm making legitimate, even traditional music, and taking it to new frontiers with computers."

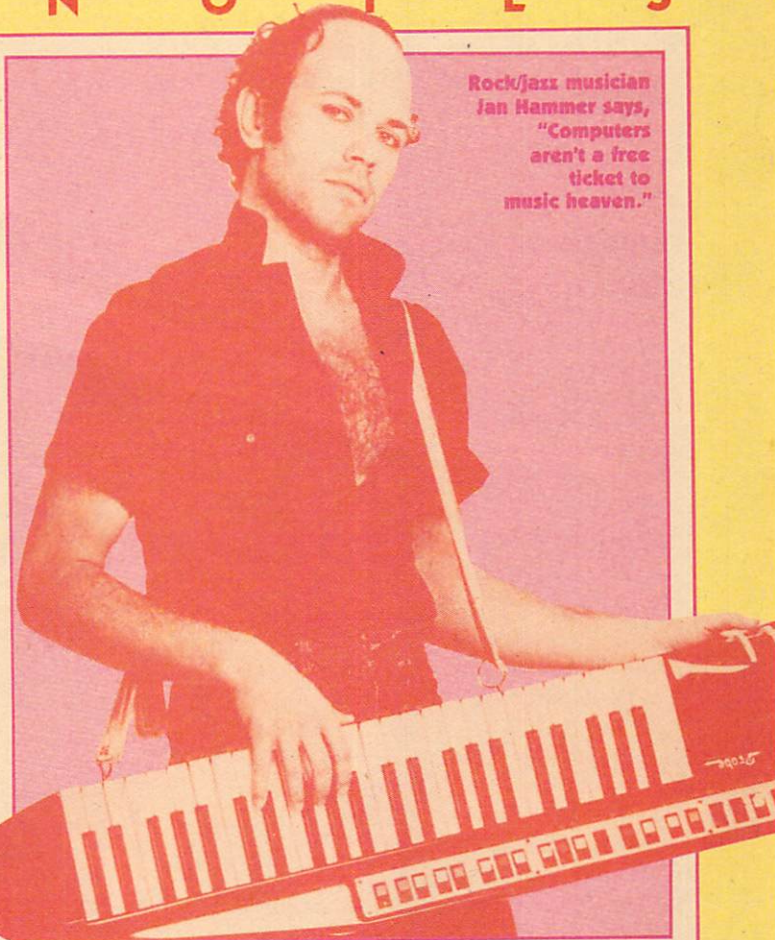
With the Fairlight synthesizer, Hammer can compose, record, and engineer the "Miami Vice" scores, as well as other music projects, by himself. "The synthesizer is a heaven-sent tool—it leaves your options open," he said. "With it you can experiment more [with] tone and length; you can go back and alter any minute portion . . . and that's what composing is all about."

Although it's computerized, Hammer's studio stands far from the hi-tech, electronic scenes of New York City and Hollywood. The Red Gate Studio lies in Hammer's home—a 150-year-old farmhouse in a tiny upstate New York town.

At any time of day or night, Hammer can retreat to his 24-track studio, which comprises four synthesizers, a Steinway grand piano, a South Indian drum, and an array of other acoustic instruments. There, he has produced and recorded soundtracks for films including **Secret Admirer** (released this summer) and **A Night in Heaven**, and albums such as *The First Seven Days*, *Black Sheep*, *Here to Stay* (with the video smash "No More Lies"), and *Scenario* (with **Al DiMeola**).

Hammer, a music buff since his childhood in Prague, Czechoslovakia, entered the computer world when the VIC-20 arrived on the market. "It was my first cautious step," he said. "I learned a little BASIC, but what I really did was get rid of the fear—I put my big toe in the water. Then a year later I had the Fairlight CMI—I made a quantum leap. I could relate to the Fairlight more because it was absolutely state of the art [in terms of music engineering]. My awareness of its computer power actually came later."

Hammer isn't concerned with staying on top of the perpetually evolving computer-music industry. "The secret in my case is not to try and keep up—don't make that your obsession—but give what you have a chance," he said. "Things don't become as obsolete as the manufacturer will try to tell you!!"



Rock/jazz musician Jan Hammer says, "Computers aren't a free ticket to music heaven."

A perfect example is the Apple IIe, Hammer said. "You can use it with the **Yamaha DX-7** and the Apple program **DX-Pro**, and really get state-of-the-art sound. And the Apple IIe is how many years old?!"

Hammer said the **MIDI interface**, in particular, has put music-making within the reach of home computerists. But he warned, "You can't expect to buy music software and do something amazing. Computers aren't a free ticket to music heaven."

"There's no substitute for a rudimentary knowledge of music," he stressed. "You need to train your ear; you need music perception. You need to be able to pluck some notes on a piano, a guitar, or any instrument, and hit a melody. Then you can use a computer, especially with an inexpensive MIDI-equipped synthesizer, and really do some amazing stuff."

—LINDA WILLIAMS

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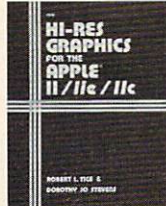
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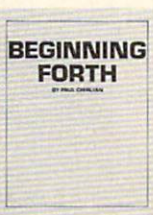
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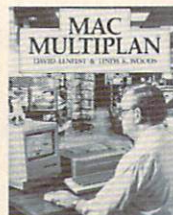
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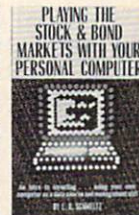
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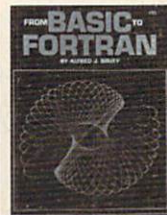
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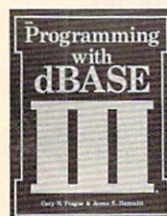
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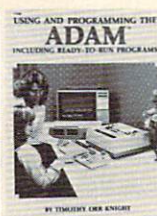
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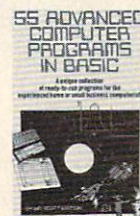
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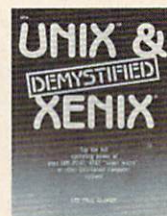
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COMPUTERS

Leading Edge Model "D"

COMPANY: Leading Edge Hardware Products, 225 Turnpike St., Canton, MA 02021; (800) 343-6833 or (617) 828-8150
PRICE: \$1,495



Leading Edge, which has marketed printers, software, disks, and computers under different brand names, has introduced a full-system IBM-compatible computer. The company says that the relatively low price of this sleek and attractive new computer brings the IBM PC world to the general consumer. IBM tried to do this with the ill-fated PCjr, and Tandy is now accomplishing the trick with the Tandy 1000.

The Leading Edge Model "D," with 256K and two disk drives, runs all IBM software, according to Leading Edge. It comes with high-resolution monochrome and color graphics built in; on the IBM PC, these are extra-cost options. A monochrome monitor also is included with the system. You can expand the RAM to 640K, and still leave four internal slots open for plug-in circuit boards. Leading Edge offers a one-year warranty on parts and labor.

The Leading Edge Model "D" is manufactured by Korea's Daewoo Group, a textile company that now makes trucks for Caterpillar and fuselage sections for General Dynamics' aircraft.

MODEMS

AT&T Modem (Model 4000)

COMPANY: AT&T Consumer Products Division, 2002 Wellesley Blvd., Indianapolis, IN 46219; (317) 352-6120
PRICE: \$499 (modem); \$79 (software)

The AT&T Model 4000 is an "intelli-

gent" 1200-baud modem for the AT&T 6300 and other IBM-compatible computers. The modem has LED lights on the front panel, but needs no buttons or switches to operate. If using the *SoftCall* software (\$79), you make all choices from a menu. Every step of the modem's operation is explained by the modem itself; any time you want more information, just press the HELP key for a complete description of each command function.

The most distinctive feature of the Model 4000 is that it will not be affected by "call-waiting" interruptions. Most modems will get knocked off the line by incoming calls if you have a "call-waiting" function. Also, the *SoftCall* communications software, sold separately and designed to be used with the modem, is quite powerful and easy to use. The Model 4000 can answer phone calls and accept files by itself, in a "remote" mode.

Avatex Modems

COMPANY: E + E DataComm, 2115 Ringwood Ave., San Jose, CA 95131; (408) 288-8880 or (800) 4AV-ATEX
PRICE: \$64 (300-baud); \$299 (1200-baud)



Avatex is a new name in the modem field. Its 300-baud modem is a "plain vanilla" type, with manual-dial and answer only. The 1200-baud modem offers the choice of manual or auto-dial and auto-answer, depending, of course, on the software you use. Both modems have an RS-232C connector; if you have an Atari, Commodore, TRS-80 Color Computer, or Timex computer, you will need an additional interface to make the connection. Both modems can be used with pulse- and tone-dial phone systems.

MARKET UPDATE

Tandy Corp./Radio Shack, looking to strengthen what it feels already is a quality product, announced at PC Expo in New York several improvements and enhancements for the Tandy 1000. "The Tandy 1000 computer is clearly the cost/performance leader in the IBM PC compatible marketplace," said Ed Juge, director of market planning for Radio Shack. "We intend to strengthen our position and keep competitive pressure on."

First off, the Tandy 1000, which runs all but four or five software packages the IBM PC runs and is considered by Future Computing "operationally compatible" with the IBM PC, now sells for \$999 (128K, one disk drive). In addition, distribution has been expanded from just Radio Shack Computer Centers to about 4,800 Radio Shack stores.

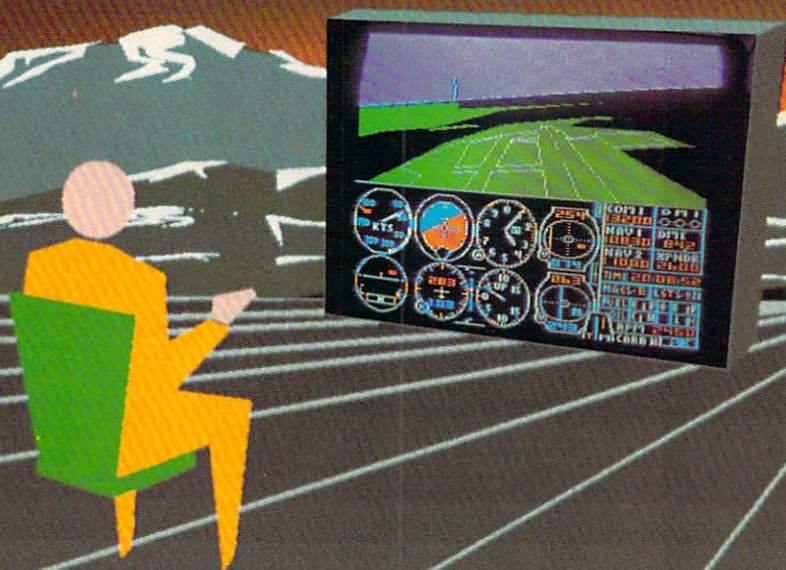
A new BASIC (GWBASIC 2.02) is replacing the original, bug-ridden BASIC that disappointed many buyers. It will be given to all current 1000 owners with registration cards, and packaged with the computer for new buyers.

Several new hardware products also were introduced. The new Tandy 1000 HD model includes a built-in 10-megabyte hard disk, and is priced at \$1,999—a good buy for those with business in mind. Current 1000 owners can purchase a 10-megabyte hard disk and controller board for \$999. A 1200-baud internal modem (on a circuit board) will sell for \$299; an internal 2400-baud modem is in the works, according to Juge. The Memory PLUS Expansion Board (\$319) expands the Tandy 1000 to 384K. A mouse or RS-232C board, and a new "inexpensive" color monitor also will be available sometime this year.

Finally, Tandy has instituted an Express Order Hardware program (a similar software program already exists) to offer customers a wide range of peripherals and add-ons from other manufacturers. This program puts Radio Shack in direct competition with mail-order vendors, and gives another option to the consumer who has trouble finding equipment. Customers place orders in Radio Shack stores, and the hardware is shipped the following day. ☐

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WHAT'S IN STORE SOFTWARE GUIDE

QUICK TAKES ON SOFTWARE— NEW AND NOTEWORTHY

Welcome to FAMILY COMPUTING's Software Guide, the most comprehensive listing available of two dozen of the newest, most noteworthy, and/or best programs on the market. Our reviewers include families from all over the country who have judged the software according to the following criteria: long-term benefits and applications, adaptability, and advantages of using a computer for a given task. Programs have been evaluated and rated for their performance in each of the categories listed below. More detailed reviews follow the chart. Unless otherwise noted, all programs are in disk format.

Here's a rundown of the rating categories and what they mean: **O** = Overall performance, given the limi-

tations and capacities of the particular computer for which the software is intended. **D** = Documentation, or the instructions and literature that accompany a program. **EH** = Error-handling, the software's capacity to accommodate errors made by the user—an especially important consideration with software for younger users. **PS** = Play system, in the games reviews, the quality of the game design and the game's playability. **GQ** = Graphics quality, also evaluated in light of each particular brand's graphics capabilities. **EU** = Ease of use after the initial learning period, which varies from computer to computer. **V** = Value for money, or how the software measures up to its price.

HOME BUSINESS/HOME MANAGEMENT

Title Manufacturer Price	Brief description	Hardware/ Equipment required	Backup policy	Ratings					
				O	D	EH	GQ	EU	V
DATABASE MANAGER Mirage Concepts Inc. 4055 W. Shaw, No. 108 Fresno, CA 93711 (209) 227-8369 \$49 © 1984	Track home inventory and mailing lists; calculate, total, and subtotal numerical data in powerful database manager. Good for small business and home use.† —AMATO	C 64/128.	90-day warranty: \$10 fee thereafter or if user-damaged; \$7 for backup.	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	N/A	A	★ ★ ★ ★
J.K. LASSER'S YOUR MONEY MANAGER Simon & Schuster 1230 Ave. of the Americas New York, NY 10020 (212) 245-6400 \$89 © 1985	A financial management program helps keep track of assets, liabilities, income, and expenses. Prints reports and graphs, and transfers information to companion tax package.† —TAETZSCH	128K IBM PC/PCjr. Planned for 128K Apple; Mac; C 64.	30-day warranty: \$5 fee thereafter or if user-damaged.	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	A	★ ★ ★ ★
PERFECT CALC Thorn EMI 1881 Langley Irving, CA 92714 (714) 261-6600 \$199 (IBM PC); \$149 (IBM PCjr); \$139 (Apple) © 1984	Electronic spreadsheet can be tailor-made to fit your accounting, calculating, and budgeting needs. Includes thorough on-screen help messages and the ability to handle up to seven sheets at once.† —TAETZSCH	Reviewed on 128K IBM PC. Also for PCjr; 64K Apple.	90-day warranty: \$10 fee thereafter or if user-damaged.	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	N/A	A	★ ★ ★ ★
PERFECT FILER Thorn EMI (See above for address and price.)	Store mailing lists, club memberships, and more. Limited report and nonexistent calculation functions make this data-base program most useful with companion Calc and Writer.† —TAETZSCH	Reviewed on 128K IBM PC. Also for PCjr; 64K Apple.	90-day warranty: \$10 fee thereafter or if user-damaged.	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	N/A	A	★ ★ ★ ★
PERFECT WRITER Thorn EMI (See above for address and price.)	Powerful word processor with spell checker and thesaurus streamlines report-, term paper-, form-letter-writing. Use with Filer, Calc, and Link, a telecommunications package. —TAETZSCH	Reviewed on 128K IBM PC. Also for PCjr; 64K Apple.	90-day warranty: \$10 fee thereafter or if user-damaged.	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	N/A	A	★ ★ ★ ★
WORD PROCESSOR Mirage Concepts 4055 W. Shaw, No. 108 Fresno, CA 93711 (209) 227-8369 \$49 © 1983	Comprehensive word processor for most serious needs allows you to move and change discrete columns, and merge data from other file programs.† —AMATO	C 64/128.	90-day warranty: \$10 fee thereafter or if user-damaged; \$7 for backup.	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	N/A	A	★ ★ ★ ★

RATINGS KEY **O** Overall performance; **D** Documentation; **EH** Error-handling; **GQ** Graphics quality; **EU** Ease of use; **V** Value for money; ★ Poor; ★★ Average; ★★★ Good; ★★★★★ Excellent; N/A Not applicable; E Easy; A Average; D Difficult; † Longer review follows chart



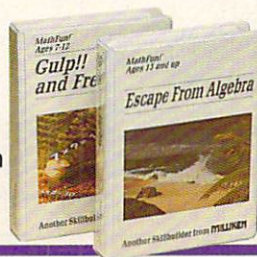
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Do you currently have a computer?

If yes, which type?

How is it used?

MILLIKEN

GAMES REVIEWS BY JAMES DELSON

Title Manufacturer Price	Brief description	Hardware/ Equipment required	Backup policy	Ratings					
				O	D	PS	GQ	EU	V
2010: THE GRAPHIC ACTION GAME Coleco Industries 999 Quaker Lane S. West Hartford, CT 06110 (800) 842-1225 under \$30 © 1984	Enjoyable arcade game has little to do with the movie. Player must repair damaged circuit boards to prevent spaceship from crashing out of orbit. One-dimensional, but fun for young gamers, ages 8+.	Coleco ADAM.	90-day warranty.	★ ★	★ ★ ★	★ ★ ★	★ ★ ★	E	★ ★
ADVENTURE WRITER CodeWriter Corp. 5605 W. Howard St. Niles, IL 60648 (312) 647-1270 \$40 (Atari, IBM PC/PCjr w/o graphics); \$50 (C 64, Apple w/graphics) © 1984	Time-consuming but worthwhile adventure construction set. Flexible design system, coupled with 115-page manual, allows for almost every conceivable text game element. Best for hard-core fans, ages 12+.	Reviewed on 48K Atari. Also for 48K Apple; C 64; 128K IBM PC/PCjr.	1-year warranty (includes user-damaged); \$15 fee thereafter or for backup.	★ ★ ★	★ ★ ★	★ ★ ★	N/A	D	★ ★ ★
BALLBLAZER Epyx 1043 Kiel Court Sunnyvale, CA 94089 (408) 745-0700 \$29-\$39 © 1985	Phenomenally exciting at first, this futuristic one-on-one soccer-type game, with state-of-the-art graphics and player control may grow dull after a few plays. For ages 10+.	Reviewed on 48K Atari. Also for 48K Apple; planned for C 64. Joysticks.	60-day warranty; \$5 fee thereafter or if user-damaged.	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	E	★ ★
BATTLE OF CHICKAMAUGA Game Designer's Workshop P.O. Box 1646 Bloomington, IL 61702-1646 (309) 452-3632 \$32 © 1985	Excellent wargame simulation of Civil War battle includes fatigue, morale, and hidden movement variables for one or two players. A major leap forward in genre for all skills, ages 12+.	48K Atari.	90-day warranty; \$5 fee thereafter.	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	A	★ ★ ★ ★
COSMIC BALANCE II Strategic Simulations, Inc. 883 Stierlin Rd., Bldg. A-200 Mountain View, CA 94043-1983 (415) 964-1353 \$39 © 1983	You take on a friend or the computer and try to develop far-flung colonies in Diplomacy/Monopoly mix set in outer space. Marshal your resources carefully in game for all skills, ages 12+.	Reviewed on 48K Apple. Also for 48K Atari.	30-day warranty; \$10 fee thereafter.	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	A	★ ★ ★ ★
PHANTASIE Strategic Simulations, Inc. 883 Stierlin Rd., Bldg. A-200 Mountain View, CA 94043-1983 (415) 964-1353 \$39 © 1985	Create an adventure team and quest into the unknown, accumulating skills, fighting monsters, and more in fantasy/role-playing game. Fun but nothing new for ages 10+.	Reviewed on 48K Apple. Also for C 64/128.	90-day warranty; \$10 fee thereafter.	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	A	★ ★ ★ ★
RACING DESTRUCTION SET Electronic Arts 2755 Campus Drive San Mateo, CA 94403 (415) 571-7171 \$32 © 1985	One or two players race and/or wreck their vehicles in complete "construction set." Modify or build from scratch existing cars, bikes, and buggies, and lay your own racecourse. For ages 8+.	C 64. Joystick(s).	90-day warranty; \$7.50 fee thereafter or if user-damaged.	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	A	★ ★ ★ ★
RAID OVER MOSCOW Access Software 3678 W. 2100 S. Salt Lake City, UT 84120 (801) 973-0123 \$39 © 1984	Superb skill-arcade game by the author of <i>Beach-Head</i> puts you in command of a multilevel assault on U.S.S.R. The game is exciting and requires true finesse, but the story line is tasteless. For ages 10+.	C 64. Planned for Atari.	90-day warranty; \$7.50 thereafter; \$10 for backup.	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	D	★ ★ ★
RESCUE ON FRACTALUS! Epyx 1043 Kiel Court Sunnyvale, CA 94089 (408) 745-0700 \$29-\$39 © 1985	Fly a spaceship across a treacherous planet surface, locating and rescuing downed pilots while avoiding enemy fire. In spite of excellent flying simulation and stunning 3-D terrain, it grows dull once players, 10+ know it.	Reviewed on 48K Atari. Also for 48K Apple; C 64. Joystick(s).	60-day warranty; \$5 fee thereafter or if user-damaged.	★ ★	★ ★ ★	★ ★ ★	★ ★ ★	A	★ ★
SHADOWKEEP Telarium Software One Kendall Square Cambridge, MA 02139 (617) 494-1200 \$39 © 1984	Knockout role-playing adventure uses limited animation and some text commands. Up to nine players can take part in one of the most involving dungeon games to date, for ages 12+.	64K Apple.	30-day warranty; \$5 fee thereafter.	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	A	★ ★ ★ ★

RATINGS KEY O Overall performance; D Documentation; PS Play system; GQ Graphics quality; EU Ease of use; V Value for money; ★ Poor; ★★ Average; ★★★ Good; ★★★★★ Excellent; N/A Not applicable; E Easy; A Average; D Difficult; + Longer review follows chart.

Software

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WHAT'S IN STORE SOFTWARE REVIEWS

On the following pages, you'll find in-depth reviews of some of the programs listed in the Software Guide. Refer back to the Guide on page 92 for information such as backup policies and addresses of software manufacturers.

This month's software reviews include only home business/home management packages and games. You'll find thorough educational software coverage in our special Educational Computing report, on page 29. Our family reviewers have gone back over the educational programs they liked best and selected their favorites. They re-reviewed all the packages that received four stars in the category of overall performance and selected those that rate as the "Best of the Best."

HOME BUSINESS/ HOME MANAGEMENT

Perfect Writer

HARDWARE REQUIREMENTS: Reviewed on IBM PC. Also for PCjr; Apple II series.

MANUFACTURER: Thorn EMI
PRICE: \$199 (IBM PC); \$149 (IBM PCjr); \$139 (Apple)

Businesspeople and professionals with heavy word-processing needs will find *Perfect Writer* capable of handling most any task. Even though most people will probably be able to manage the program using just the help screens and the menus, I recommend spending a good hour or two with the disk-based lesson to acquaint yourself with the package's many dimensions.

Perfect Writer lets you keep up to seven documents in memory at once. You can work on two of them simultaneously, thanks to a split screen feature. This lets you, say, write a report from an outline, or refer to notes while writing a term paper. Searching through text for a phrase or word, replacing words, and changing characters or dates in a story, are easy. With a single command, you can even search through all the documents on a disk. More sophisticated operations are possible through the use of the package's special format "environments," the powerful but often confusing commands that will automatically itemize objects you list, or number paragraphs, for instance.

Considering its power, you'd think *Perfect Writer* would require a special degree just to operate. Not so. Menus take care of the basic commands and when you get used to the system, you can switch over to function keys for more immediate, direct control.

Powerful as the program is, using some of the common word-processing format commands—double-spacing and bold-facing, for instance—is more difficult than it should be.

The program's few shortcomings are bearable and more than compensated for by the thorough, well-indexed manual, and the built-in spelling checker and thesaurus.

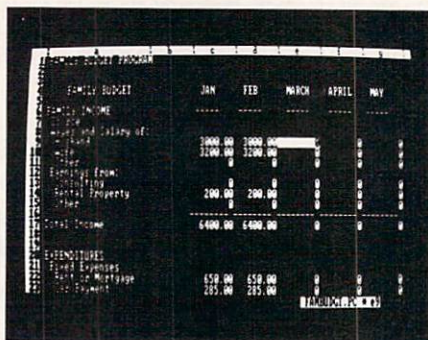
—LYN TAETZSCH

Perfect Calc

HARDWARE REQUIREMENTS: Reviewed on IBM PC. Also for PCjr; Apple IIe/IIc.

MANUFACTURER: Thorn EMI
PRICE: \$199 (IBM PC); \$149 (IBM PCjr); \$139 (Apple)

Like other spreadsheet programs, *Perfect Calc* electronically replaces the bookkeeper's ledger page. It does away with the tedium of having to enter rows and columns of numbers by hand, and totaling and averaging to figure business or club budgets. Like all electronic spreadsheets, you can tailor the pages to fit your particular needs, entering functions so that totals automatically change as relevant figures change. Sample applications with formulae, rows, and columns already in place include a family budget, check register, a balance sheet, and worksheet for keeping track of stock purchases and sales.



	JAN	FEB	MARCH	APRIL	MAY
FAMILY BUDGET					
FAMILY INCOME					
Salary	3000.00	3000.00			
Interest	100.00	100.00			
Dividend	200.00	200.00			
Other					
Total Income	4000.00	4000.00			
EXPENDITURES					
Food	450.00	450.00			
Auto & Mortgage	200.00	200.00			
Other					
Total Expenses	650.00	650.00			

Perfect Calc's usefulness is most apparent when applied to small business use. You can store as many as 15 different data sheets (or ledger pages) in memory at once. You can easily switch back and forth between them and even display two on the

screen simultaneously. For example, you can cross-reference data between spreadsheets if you have several sub-budgets to put together as part of one large one.

Use Thorn's companion *Perfect Writer* to elaborate on your spreadsheet or incorporate it into written reports. Set up a spreadsheet using data stored in *Perfect Filer*, the *Perfect* trio's limited data-base management program. Or calculate numerical data transferred from *Perfect Filer*.

—LYN TAETZSCH

Database Manager

HARDWARE REQUIREMENTS: C 64/128.
MANUFACTURER: Mirage Concepts
PRICE: \$49

A data base is worse than useless if it can't handle all the information you have, or doesn't allow easy access to it once you've gone to the trouble of storing it. Users with limited filing needs who anticipate expanding their files will find Mirage's file program a fine package.

Thanks to a technique called "screen painting," you can customize your file records—placing different information categories wherever you wish on the screen. Up to 2,000 characters are allowed for each record—a few screens' worth—enabling you to store considerable amounts of information on each record.

When creating my household inventory file for insurance purposes, for instance, I could file all the items in each room together with their serial numbers, location and date of purchase, the original cost, current value, and more. When I ran out of room at the bottom of the screen, I simply kept on typing and the screen scrolled upward.

I especially liked the system's capacity to handle mathematical operations. The advanced report generator included with the package lets you create sophisticated reports that will total and subtotal numeric information, and have more control over the organization and retrieval of information.

—FRANCIS AMATO

Word Processor

HARDWARE REQUIREMENTS: C 64/128.
MANUFACTURER: Mirage Concepts
PRICE: \$49

Mirage's professional-level *Word Processor* boasts a full lineup of extra features that would make the package appropriate for most heavy-duty word-processing tasks. An 80-column mode will let C 64 users

WHAT'S IN STORE SOFTWARE REVIEWS

with a good monitor see more of their text at a time. A feature that I haven't seen in any other C 64 word-processing program lets you move and freeze columns of text, in addition to blocks. This makes the package ideal for creating charts and newsletters, since you can edit one column without affecting other columns on the page.

Mirage Concepts touts the package's 80-column mode as a selling point of its word processor. My 1702 Color Monitor, however, was unable to clearly display text in the denser mode.

But another feature, the 30,000-word spelling checker, out-rates the two other packages I use. By checking the dictionary it will even offer spelling alternatives to any incorrect words it detects.

Because of an unusual command structure, the package may take some time to learn. Instead of the usual (mnemonic) CTL-S for SAVE, and CTL-T to move to the top of the text, there doesn't seem to be any method to the system. Of course, anyone who uses this program regularly will grow used to these idiosyncracies.

Used in combination with a database manager, such as Mirage's program (reviewed above) or any other program that creates standard Commodore "sequential" files, Word Processor will take care of most home business and intensive word-processing needs. —FRANCIS AMATO

J.K. Lasser's Your Money Manager

HARDWARE REQUIREMENTS: Reviewed on IBM PC/PCjr. Planned for Apple II series; Macintosh; C 64.

MANUFACTURER: Simon & Schuster
PRICE: \$89

Not for every family, but for those with tough, unwieldy financial matters to care for, *Your Money Manager* provides the structure to organize and plan your financial future. You're better off knowing a bit about accounting practices, but the manual does give you beginning guidelines, including a comprehensive glossary.

You start off by listing your present financial situation. Write down your assets, liabilities, and income on separate sheets of paper and create accounts for each item. This means that before using this package at all, you must have some handle on your financial state.

Fill in the blanks and follow the straightforward prompts to enter account descriptions. Then start entering transactions—that means every single paycheck, dividend check, refund, mortgage payment, bank deposit. This will all take some time, but if you limit your sessions with the software to weekly or monthly encounters, you can take care of several days' worth at a time. If updated vigilantly, the program will print out thorough budget and income statements, net worth reports, and more. You'll have a record of every dime you spent or earned, and see your investments' progress or lack of it.

If used with the account codes listed in the instruction manual, you'll be able to merge the data together with Simon & Schuster's *Your Income Tax*, to greatly simplify the reporting and calculating process.

—LYN TAETZSCH

GAMES

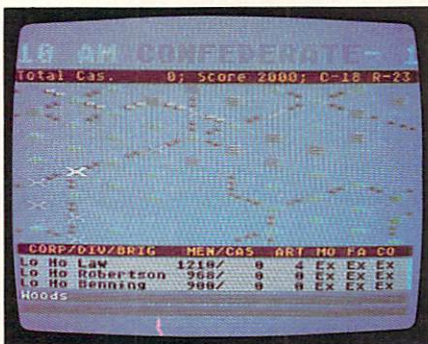
The Battle of Chickamauga

HARDWARE REQUIREMENTS: Atari Home Computers.

MANUFACTURER: Game Designer's Workshop

PRICE: \$32

CRITIC'S SUGGESTED AGE RANGE: 12 +



September 1863. The Confederacy has had a bad summer, with decisive defeats at Gettysburg and Vicksburg seriously limiting its chance for victory against the Union. Under the command of General William Rosecrans, the Northern Army of the Cumberland has been attempting to eliminate the rebel presence led by General Braxton Bragg in Eastern Tennessee. After weeks of maneuvering, the armies meet at Chickamauga Creek, near Chatanooga. The South loses, only because of a series of mistakes on both sides. Problems in issuing commands prevented coordinated attacks. A new form of

mounted infantry, armed with repeat-fire rifles, added a new dimension and advantage to the Union forces. And although the South held the field to the end, the writing was still on the wall.

You and a friend, or you playing against the computer, can alter history by assuming one of the sides in this exciting strategy tactics recreation of the crucial Battle of Chickamauga. A highly flexible menu of options lets you determine the complexity of the simulation, adding elements of fatigue and morale, if desired. You can choose to make fighting units visible to each other regardless of their position on screen. Deciding not to make them visible in all positions adds a realistic element to the battle. (In real life, obviously, you can't easily fight against units you can't see.)

Visibility and fatigue elements, by now, are old hat in wargaming. But tying them together and throwing in the variable of morale, and having all these elements contribute to the units' condition make for a dynamic breakthrough. The designers have given us a highly playable, if initially tough, wargame—the year's best so far. Playtesters of varying skill levels, even beginners, all applauded it enthusiastically.

Racing Destruction Set

HARDWARE REQUIREMENTS: C 64.

MANUFACTURER: Electronic Arts

PRICE: \$32

CRITIC'S SUGGESTED AGE RANGE: 8 +

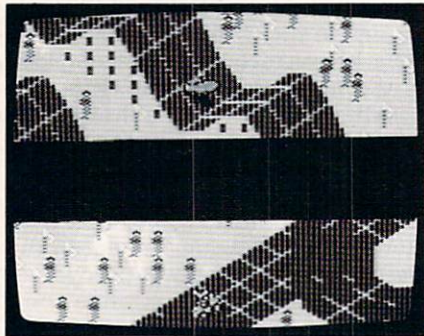
This is a bonus year for sports programs. We've already seen outstanding football, tennis, and road racing programs. Now, Electronic Arts has come out with the first demolition derby. Far more than just a crash and bump game, this is the first authentic sports construction set. Driving tailor-made vehicles on existing or custom-made racecourses, one or two players race and/or try to wreck one another.

Electronic Arts' excellent, easy-to-use menu system lets players select from 10 stock vehicles. Pick from can-ams, street and dirt bikes, race cars, jeeps, dune buggies, moon buggies, and even VW buggies. You can enhance your set of wheels with such variables as engine size, land mines, oil-spewing devices, and tire sizes. All of these affect the weight and speed of your vehicle.

Once you've completed it, you can modify your masterpiece endlessly—

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adjusting it to the various tracks you lay down. Use one of the 50 on-disk tracks as is, or build ones to your liking. More experienced racers can build their own courses completely from scratch. Road selections vary even more than vehicle choices! Select from three different road surfaces, lay down jumps, and hairpin, "s", banked, raised, and regular



turns. Add bumps, crossovers, short cuts, and even variable gravity, so that if you jump or bump, you don't come down with the same force. Fun to build and experiment with, and even more of a thrill to race on, *Racing Destruction Set* will furnish many, many hours of entertainment.

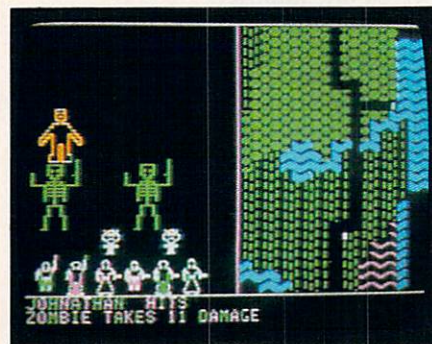
Phantasie

HARDWARE REQUIREMENTS: Reviewed on Apple II series. Also for C 64/128.
MANUFACTURER: Strategic Simulations
PRICE: \$39

CRITIC'S SUGGESTED AGE RANGE: 10+

After its superb entries in the fantasy/role-playing field, *Galactic Gladiators* and *Galactic Adventures* of years past, I'd expected Strategic Simulations' *Phantasie* to be a knockout. Instead, I found a state-of-the-art, *Ultima*-like role-playing game, which, although an excellent program (one of the year's best for that genre), relies too heavily on a tried-and-true formula.

Like most fantasy role-playing games, you begin by creating an ad-



venture team. Sort of like casting a movie, you put together a variety of character types and "races" with different strengths and weaknesses. You then set out on a quest into unknown territory, scrolling across a landscape where you meet up with all manner of monsters. With each fight, you gain or lose strength, while your character grows and develops experience points. As you grow familiar with your fantasy surroundings, you'll acquire and learn spells to transport you from town to town, which beats walking and saves valuable energy points, too. *Phantasie* features all the fun and excitement you'd find in other top role-playing games but, unfortunately, there's nothing new here.

This is not to discourage fantasy adventurers from buying *Phantasie*. Play can involve six characters; the dungeons are clever; and characters have more traits than found in most games of this type. Still, the game never flies above the rest of the genre. Playtesters found it absorbing and interesting, but all agreed—no breakthrough.

Shadowkeep

HARDWARE REQUIREMENTS: Reviewed on Apple II series.

MANUFACTURER: Telarium

PRICE: \$39

CRITIC'S SUGGESTED AGE RANGE: 12+

Depending on how you look at it, *Shadowkeep* is either the best text/graphic adventure game ever put on disk, or an interesting attempt to merge that genre with *Ultima*-like multicharacter role-playing adventures. At any rate, it's a knockout.

No game has ever used the text/graphic adventure format more imaginatively. Limited animation lets players "walk" through corridors, see doors "open," and see creatures get larger as they approach. The 3-D color images are a giant step beyond the black and white lines used in *Wizardry*. And the game's four-disk format means you have a huge number of detailed rooms to travel through. This graphic superiority makes it the most engrossing dungeon gaming experience to date.

A fun character-generation system lets you put together questing teams of up to nine characters. Its ease of use allows even rank beginners to enter the dungeons and start enjoying the adventure immediately. *Shadowkeep's* one drawback lies in its

sluggish combat system. This is because as many as nine different characters participate in any one fight sequence. Typing the different



orders—to hold ground, strike, or, say, cast a spell—slows the pace down considerably. No matter, it's still a must for dungeon adventurers, even for those younger than 12, with adult help.

Cosmic Balance II

HARDWARE REQUIREMENTS: Reviewed on Apple II series. Also for Atari.
MANUFACTURER: Strategic Simulations
PRICE: \$39

CRITIC'S SUGGESTED AGE RANGE: 12+

Explore, colonize, commercialize, and finally defend your galactic conquests in this one or two player challenge. This computerized combination of "Diplomacy" and "Monopoly" lets you build up farflung commercial empires while seeking to keep your opponent from expanding. Economic and military elements might play equally crucial parts in your mushrooming territories.

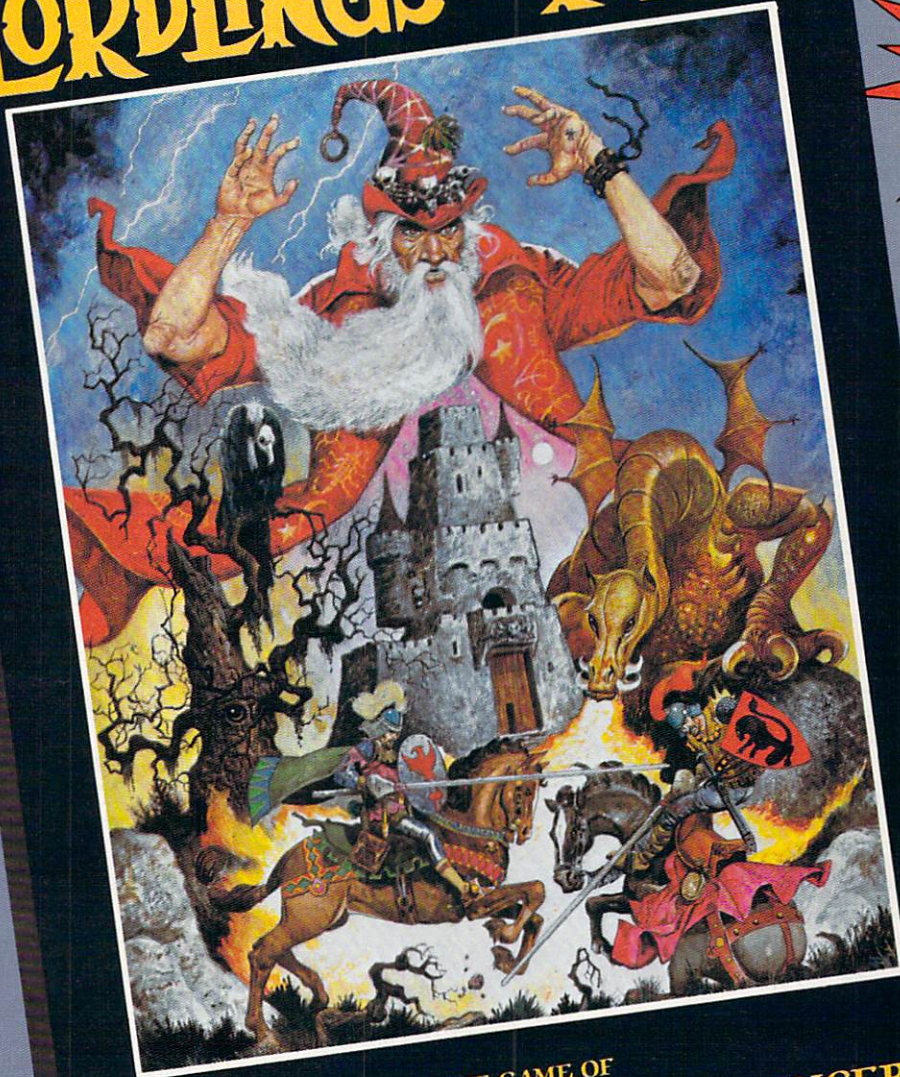
You have to marshal your resources carefully. In order to expand, you not only have to transport goods around your colony and protect it against aggressor nations, you have to construct the patrol and select cargo ships in the first place. You may decide to raid opponents' convoys as well. For the security and growth of your empire you must guard outposts and invest in ships cheap enough to increase your profit margin, but expensive enough to withstand attack.

This dynamic *Star Trek*-like game has only one major drawback: Only one or two may play at once. Nevertheless, with plenty of different strategies to use, and a wide number of ships to select among, beginning to advanced playtesters found it thrilling and highly playable.

—REVIEWS BY JAMES DELSON

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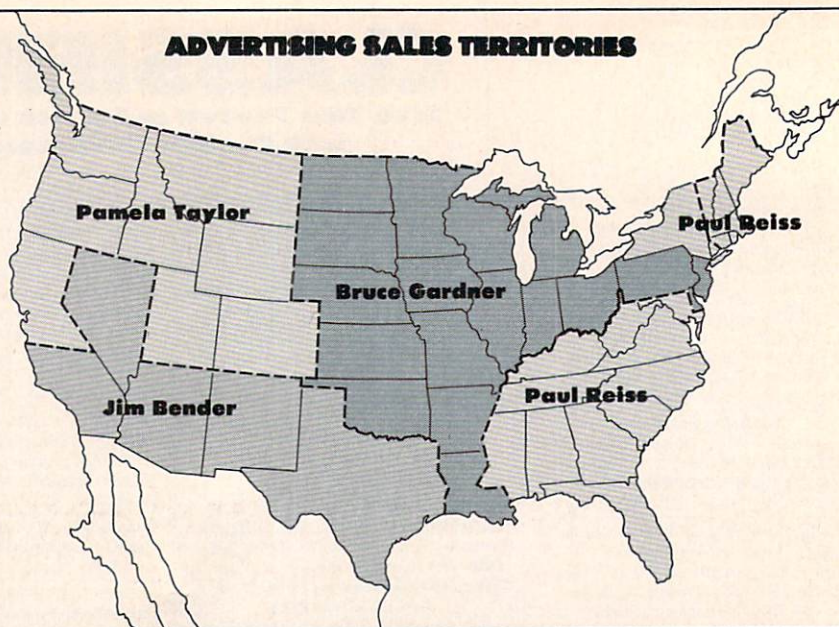
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Reader Service No.	Advertiser Index	Page No.
1	Apple	C2, 1
	Atari	56, 57
2	Batteries Included	5
	Brother Inc.	8
	Classified	102, 103
3	Cleveland Institute of Electronics	65
4	CME Associates	101
5	Coleco Industries, Inc.	73
	Commodore	C4
6	CompuServe Information Systems	15
7	Computer Direct	61
	DAK Industries	19-26
8	Davidson & Associates	27
9	Epson	50, 51
10	Extended Software Co.	100
11	Family Discount Computer Products	79
12	Focus Electronics	70
13	Grolier Electronic Publishing	28
14	Grolier On Line Division	13
	Halix Institute	100
15	Hunt's Software Works	100
16	Keron Productions, Inc.	100
17	KMS Educationware	16
18	M.W. Ruth	101
19	Marymac Industries	101
20	Milliken Publishing Co.	93
	Mindscape Inc.	69
21	My Child's Destiny	100
22	Nibble Notch	16
	North Hills Corp.	100
	North Hills Corp.	101
	NRI McGraw-Hill	17
23	Precision Data Products	100
24	Prime Software	63
25	Protecto Enterprises	60
26	Quest Learning Systems	70
27	Quinsept, Inc.	100
28	Random House	67
	Scarborough Systems	11
29	Scholastic Software	80
30	Softlore Corp.	99
32	South-Western Publishing Co.	95
33	Spinnaker Software	6, 7
34	Spinnaker Software	9
35	subLOGIC	91
36	TAB Books	89
37	Tenex Computer Express	77
38	Thomson Computer Products	C3
39	Timeworks, Inc.	2
	U.S. Air Force	59
40	Verbatim Corp.	52

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33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48
49	50	51	52	53	54	55	56
57	58	59	60	61	62	63	64
65	66	67	68	69	70	71	72
73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88
89	90	91	92	93	94	95	96
97	98	99	100	101	102	103	104
105	106	107	108	109	110	111	112
113	114	115	116	117	118	119	120
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129	130	131	132	133	134	135	136
137	138						

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33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48
49	50	51	52	53	54	55	56
57	58	59	60	61	62	63	64
65	66	67	68	69	70	71	72
73	74	75	76	77	78	79	80
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97	98	99	100	101	102	103	104
105	106	107	108	109	110	111	112
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137	138						

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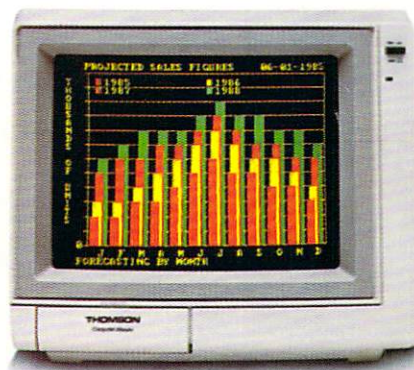
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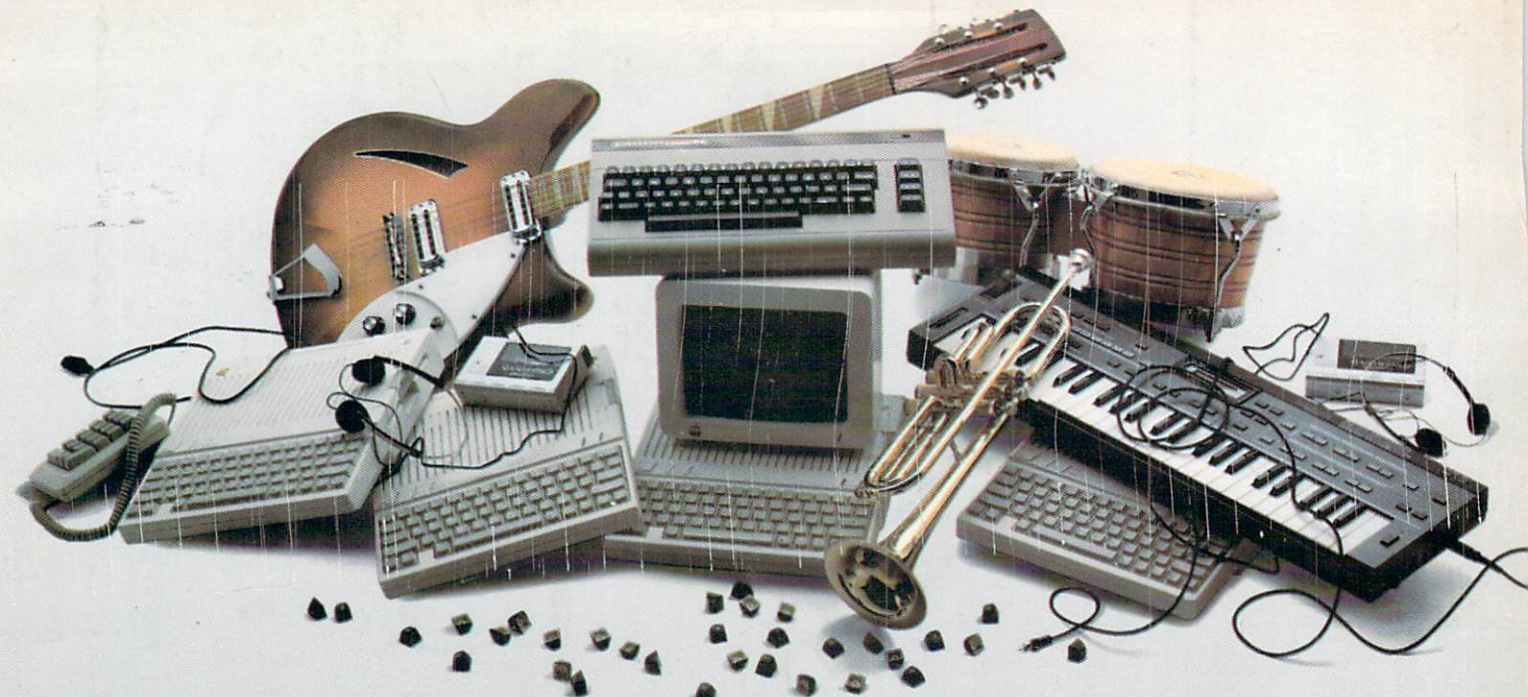
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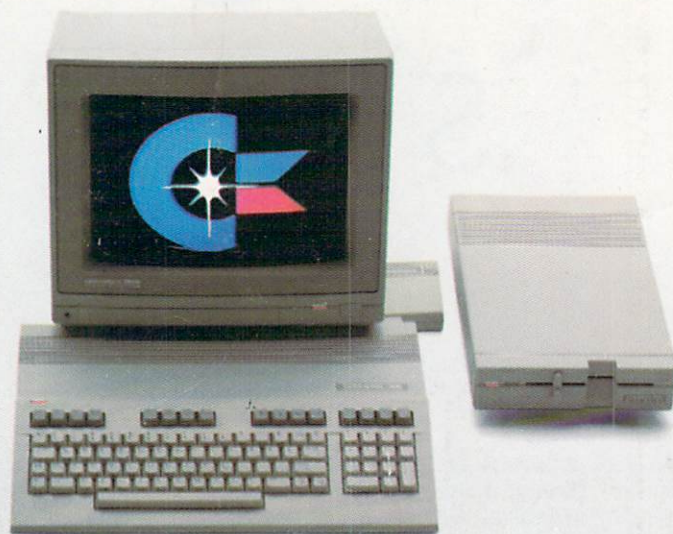
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